The Veterinary Record

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 1. JANUARY 5, 1935. Vol. XV.

General Articles

REMARKS ON THE DOUBLE INTRADERMAL TUBERCULIN TEST*

JOHN WEIR, M.R.C.V.S., D.V.S.M.
Veterinary Department, County Offices, Hamilton

I make no apology for introducing a subject which by this time may be considered somewhat threadbare, but to us as veterinary officers in Scotland it is of vital importance, and it is only by close observation and exchange of views that we can become really expert in reading the results of the double intradermal tuberculin test.

I am not going to discuss the efficiency of the test, as I am perfectly satisfied on that score, nor describe the technique, but merely to express one or two opinions and mention a few points which I have noticed as a result of a fairly wide experience in applying the test. Some of them may appear trivial, and may even be well enough known to you all, but if my effort gives rise to a discussion from which we may all profit, then the introduction of this subject will have fulfilled its purpose. I shall try as far as possible to group my remarks under separate headings, as the test is performed.

Site of Inoculation.—After performing the test on various parts of the body, I consider that the side of the neck just immediately in front of the edge of the scapula on the middle line is the best site both for personal safety and ease in application. I can perform the test much more quickly in the caudal fold, but I never feel safe when so doing and I consider it more difficult to interpret results at this site. It is quite easy to recognise a good reaction or the definitely negative nodule but there is not the chance of noting character with the same precision in border-line cases. It is much easier, of course, if the animal has two well-defined caudal folds but I find in practice that the conformation of a fair percentage of animals does not readily lend itself to the application of the test at this site. Many have thick, flat tail heads that are difficult to handle; some have thick, ill-defined folds in which it is impossible to detect slight œdema, and finally, for the sake of cleanliness, especially during the summer months, the neck is much to be preferred.

Preparation of the Site.—In my opinion, no preparation of the skin is necessary except that a small area should be clipped unless the hair has recently been cast. My only reasons for advocating clipping are that it is much easier to find the original seat of inoculation at the 48th hour, and one is able to deliver the dose of tuberculin with a little more precision if the skin is bare. Disinfectant should never be used. On one or two occasions I have seen considerable œdema of the skin caused by the washing of the clipped area with disinfectant prior to my visit.

In these days of calcium injection and vaccination for contagious abortion, it is well to examine the site of inoculation before injecting the tuberculin, as swellings are often left in the skin as a result of these operations which, if not noticed at the first visit, might lead to confusion at the 48th and 72nd hours, especially if the same person is not present at each visit. I have even seen warbles on the neck which, on a casual examination, could quite easily be mistaken for a reaction.

If a close examination is made, a small nodule or nodules will often be found as a result of previous tests. In the past I have been blamed for giving an animal two injections in different places at the same time when, in fact, one of the nodules was the result of a previous test. Why they persist in some cases I cannot say, except perhaps that the injection may have been made too superficially, and complete absorption did not take place. Whether an animal ultimately becomes a reactor or not does not appear to influence their persistence. The re-application of tuberculin, however, at a different site on the neck would seem to cause some degree of reactivation, as many increase in size, and when an animal becomes a reactor the amount of reactivity appears to be greater.

Occasionally one comes across a cow with a few small intradermal nodules which are very difficult to distinguish from the nodules caused by the injection of tuberculin. What the condition is I cannot suggest, but in such cases it is well to make a special mental note of where the tuberculin is injected.

I am not going to say anything about measuring the skin except to state that, in my opinion, it is a waste of time.

The Injection.—It is very important that the tuberculin should be correctly injected—that is,

* Presented at a meeting of the Scottish Society of Veterinary Inspectors, at Glasgow, October 3rd, 1934.

into the deeper layers of the skin. It has always been emphasised that after delivering the dose a small pea-like swelling at the seat of inoculation should be felt. I admit that this is as it should be, but it does not necessarily follow that the dose has been correctly placed. The dose can be given subcutaneously and still there may be a nodule, but in this case it takes more the form of a plaque, is less firm, convex, and circumscribed than it should be, and will have disappeared altogether at the 48th hour except perhaps for a slight puffiness at the seat of inoculation. If there is any doubt about a dose being given subcutaneously it is a good plan to examine the site after finishing the herd, because all intradermal injections swell almost immediately and it is an easy matter then to determine whether or not the dose has been given intradermally. When a dose is repeated for any reason, the second injection should always be given well away from the first. If given close together and a nodule should result from both injections, their combination may give rise to rather an awkward swelling.

At the 48th hour.—The greatest difficulty is often the finding of the original seat of inoculation in unclipped animals. If there is any doubt, however, about a particular nodule being the correct one, a closer examination will remove any dubiety. A small pin-point coagulum of lymph will always be found where the needle entered the skin. In many cases there may even be a small coagulated film of lymph with matting of one or two hairs.

At the second visit it is very important to make any records of swellings before giving the dose. As I have already said, the injection of tuberculin causes an immediate swelling and this obscures the true character of the reaction for the time being in many cases.

INTERPRETATION OF RESULTS

I discuss this heading with a little fear and trembling, as it is very difficult to describe on paper what actually happens. At the outset I may say that there does not seem to be any difficulty about the definitely negative or definitely positive reaction, but in between there appears to be a troubled water disturbed by doubtful reactions. I am of opinion that many of these so-called doubtful reactions occur because of

(1) the failure of the interpreter, probably through inexperience, to grasp the real significance of the reaction;

(2) lack of courage to classify a valuable animal as a reactor because the swelling is not so large as it might be, although showing other characteristics of a reaction;

(3) wrongly placed injections;

(4) different persons being present at the 48th and 72nd hours;

(5) rubbing on the part of the animal;

(6) delay in the temporary immediate swelling caused by the injection returning to normal.

I shall discuss each heading in turn, except (2) which explains itself.

(1) To my mind, one of the chief drawbacks of the double intradermal tuberculin test is that it requires a fairly large experience to promote confidence in reading results. Experience of course is the keynote in most veterinary matters, but it applies particularly in the case of the intradermal test. I think I have applied the test as often as most veterinary surgeons in this country and even yet I come across a few cases where, in spite of close observation, I cannot give a definite decision. Such cases are often a little disconcerting, but in most instances the doubt does not appear to lie so much in the test itself as in the mind of the interpreter. By that I mean that the test almost always gives a correct enough rendering of the state of affairs, but we fail to grasp the real significance of the reaction.

(3) Wrongly placed injections may influence the final results. If the injection is too deep, the swelling in a non-reacting animal may be twice the size it should be, even up to one-inch in diameter, but remains hard and circumscribed. If the tuberculin has what I may describe as "run," when being injected, the swelling is long shaped and ill-defined at its edges. In neither of these cases, of course, is pain present. The superficial injection can give rise to what might be regarded as a doubtful reaction in the case of reactors. In this case I suppose the tuberculin has not come into sufficiently close contact with the blood stream, and consequently has only given rise to what might be described as half a reaction. It takes the form of a large nodule, is circumscribed, not attached to the underlying tissues, but painful. Practically the same thing takes place at times when the test has been performed in a part where the skin is hidebound.

(4) I consider it is absolutely essential that the same person should conduct the test throughout. Many reactions require very close observation if definite results are to be arrived at, and it is very necessary to know the nature of the swelling at the 48th and 72nd hours, and its behaviour after the second injection. This information can only be gained if the same person is present at each visit, as no words or figures can ever convey to anybody else an exact impression of the reaction. Otherwise, an occasional reactor or a non-reactor will find itself in the doubtful category. Further, if one man applies the test he is best able to know where the injections were given and so confusion

with swellings not the result of the use of tuberculin is avoided.

(5) In odd negative reactions there appears to be a degree of itchiness and, as a result of rubbing, the nodule becomes enlarged and may even be slightly painful, but is circumscribed. There is always evidence, however, that the animal has been rubbing and I have never seen a reactor do so, the pain I presume preventing it.

(6) As I have already said, the injection of tuberculin causes a swelling at the seat of inoculation almost immediately and it would appear to be more pronounced after the first injection than after the second. Undoubtedly this is due to traumatism, and when I use this word I wish it to include, for the purposes of this paper, not only the purely mechanical injury caused by the injection of tuberculin but also the reaction of the tissues to the non-specific substances in the tuberculin. The swelling appears to reach its peak and subside within the first 24 hours, but in a few cases it lingers till the 48th and the 72nd hours. It is those lingering cases which give rise to doubt because of their character. In extreme cases I have seen such swellings reach considerable dimensions, but they tend to decrease in size after the 48th hour rather than increase as is the case with reactors. I will refer to other characteristics later.

I admit nevertheless, in spite of what I have just said, that I do come across a number of doubtful cases which cannot be accounted for. It has been said that everything which deviates from the strictly negative should be regarded as a reaction. That statement, although containing an element of truth, is in my opinion too sweeping. From my experience, however, I would say that genuinely doubtful reactions only occur in herds where reactors are present or where a number of reactions are brewing, and if one were to regard all such as positive there would not be many mistakes made. Subsequent retests have convinced me of the truth of this statement.

Symptoms of a Reaction.—As you all know, the cardinal symptoms of a reaction are heat, swelling and pain, and I should like to say a word about each—but, as you will appreciate, it is difficult to discuss the symptoms independently. Regarding heat, I must confess that I am unable to detect it except in extreme cases and for all practical purposes it is too vague a factor on which to place much stress, although it must be present in all reactions.

Swelling is important, but to judge the positive or negative character of a reaction in terms of millimetres is hopeless. It is the nature of the swelling rather than its size which is the true criterion. At this point I would mention the hard texture of the negative reaction. I particularly emphasise this hardness as I consider it an important characteristic of a non-reaction and one to which the fingers become very sensitive and which they easily recognise. When referring to the swelling caused by a reaction, the two adjectives, diffuse and œdematous, are almost invariably used. These two qualities usually denote a reaction, although some reactions occur which are not diffuse but remain sharply circumscribed and only very slightly œdematous, their true character being disclosed by the presence of pain. Further, the traumatic swelling which I described as lingering is diffuse and œdematous, but in this case the œdema is not so turgid as is the case with a reactor, feels flabbier, and the pea-like nodule is often felt in its centre. Peculiarly enough, pain is never detectable, and as I have already said, the swelling tends to decrease towards the 72nd hour in contradistinction to a reaction. Occasionally one comes across a negative nodule with a dependant, painless, œdematous swelling. In my opinion, this is also due to the same cause.

If the swelling at any time feels attached to the underlying tissues, no matter what its size, the case should always be regarded as a reactor. The same applies if there is any cording of neighbouring lymphatic vessels. Occasionally the swelling takes the form of a plaque, especially at the 48th hour. This also, in my opinion, is a reaction. In odd cases one finds a large nodule, even up to an inch in diameter, very convex, appearing to rest on the skin, and painless. I consider that this is produced by a wrongly placed injection.

In my view, pain is the most important symptom of a reaction, and no matter what the other characteristics are, if there is a definite suggestion of sensitiveness, the case should always be regarded as a reactor. Up to the present I have met with quite a few cases where the swelling was typically negative in character except for pain and in each instance tuberculosis was found on *post-mortem* examination. In some cases the evidence of pain may not be easy to detect, especially in a fractious animal, but with the exercise of a little time and patience there should be little difficulty. My practice when in doubt is to palpate five or six different parts of the skin of the neck and then the site of the inoculation, trying to exert the same pressure each time. This is repeated a few times if necessary. I find it a great advantage if the animal's attention can be directed elsewhere or if an assistant grips it by the horn and puts his arm round the nose.

A Suggested Modification

Since the double intradermal tuberculin test has been used very extensively in recent years, the question naturally arises, in view of the

experience gained, whether any modification in technique would be advisable. While I do not wish to enter into any discussion on the reliability of this test compared with any other, I must say that personally I am satisfied with it as a test for the detection of tuberculosis if properly conducted. I do not say it is a hundred per cent. accurate, any more than any of the other tests are—or for that matter, any test into which the human element enters—but for all practical purposes it is reliable enough to achieve any end to which it may be employed. As a modification, however, I would suggest that only one dose should be given instead of two, and the results read at the 72nd hour. I cannot say that I ever saw a definitely negative case at the 48th hour which was positive at the 72nd after the injection of a second dose. Every reactor shows some evidence of reaction at the 48th hour and the best that a second dose achieves is to intensify symptoms which already exist. Further, a reaction goes on increasing in intensity till about the 72nd hour, so that the evidence of pain and swelling is usually more pronounced then than at the 48th hour, even without the application of a second dose. By giving one dose only and waiting for three days, the effects of traumatism, already referred to, have disappeared, and on the whole I think results could be read with more precision.

. . . . .

I should like to say one word about the intrapalpebral test. I must admit I am rather fond of this test, as I consider it the most accurate of all. Its only drawback is that it is a little awkward to apply and in some cases impossible. It has the advantage, however, that it matures in 24 hours and any evidence of diffuseness may be regarded as a reaction. As a cross test it is very useful. If at the 48th hour I meet with a swelling which I consider will be doubtful at the 72nd hour, it is my practice to apply the intrapalpebral test and since it matures in 24 hours, a definite decision can usually be made at the third visit.

FIREARMS COMMITTEE AND HUMANE KILLERS

In their recently-issued report, the Departmental Committee on the Statutory Definition of Firearms and Ammunition state that they consider that it is advisable, in the interests of public safety, that persons purchasing or possessing free bullet firing humane killers should be required to obtain ordinarily renewable firearm certificates, but that, as it is desirable not to discourage their use, the Firearms Act, 1920, may, in regard to this type of implement, be to some extent modified. The object in view is to secure a measure of police control. Humane killers of the free bullet type and ammunition therefore ought to be obtainable only by certificated persons.

THE VETERINARY PROFESSION IN SOUTH AFRICA: A VETERINARY ACCOUNT OF THE ZULU WAR, 1879

H. H. CURSON, F.R.C.V.S., Dr. Vet. Med. (Hannover), Onderstepoort

Introduction

This campaign, although extending only from January to August, was the most important from a veterinary point of view that had yet taken place in South Africa, chiefly for the reason that it was the first occasion upon which the Army Veterinary service had participated as an independent department.

The operations may be divided into two phases: (*a*) *the initial,* from January to March, when only two military veterinary surgeons were present (First Class V.S. Francis Duck—now Sir Francis Duck—and V.S. Benjamin L. Glover) (these officers worked quite independently of each other); and (*b*) *the final,* from April to August when twelve additional veterinary surgeons, with a Principal Veterinary Surgeon (local)[1] accompanying reinforcements from Great Britain, arrived. It must be emphasised that two of these veterinarians, namely, Messrs. J. Lambert (17th Lancers) and S. Longhurst (1st Dragoon Guards), being cavalry officers, had not then become part of the Army Veterinary Department.[2]

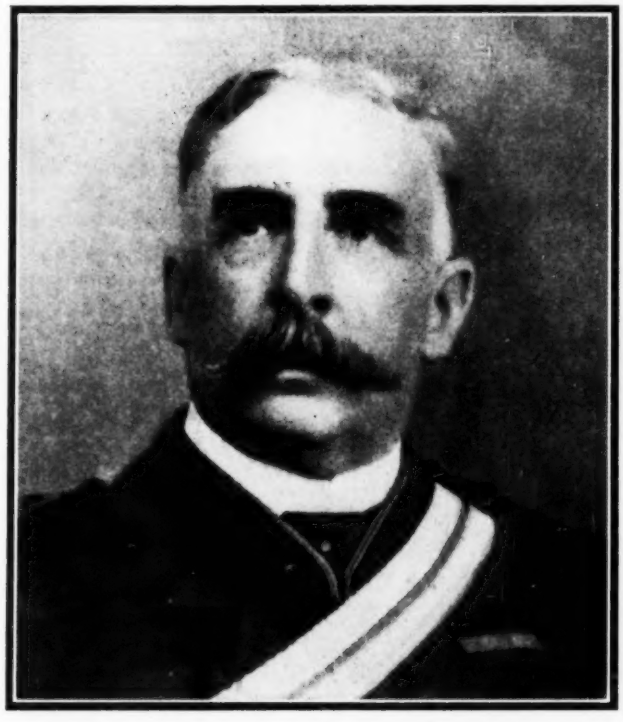
The purely veterinary side of the final period of the campaign has received attention in the *General Report of the Veterinary Department* (published by Harrison & Sons, London), compiled by P.V.S. (local) T. P. Gudgin for the information of the P.V.S. (War Office) who at the time was James Collins.[3] Excellent as the Report is, it lacks the interest of an account describing the veterinary aspect of the various movements which together make up a campaign. Smith (Sir Frederick) in his *A Veterinary History of the War in South Africa,* 1899-1902 (Supplements in *The Veterinary Record,* 1912-14) succeeded admirably in this type of narrative, but not only did he have access to official documents, but he took part in the campaign and obtained information from many of his brother officers.

[1]Who nevertheless secured all the privileges of the rank, a precedent hereby being established.

[2]On April 22nd, 1878, the Army Veterinary Department was created, but it was not until April 1st, 1881, that the veterinary surgeons of the cavalry became incorporated.

[3]The *General* Report was published in *The Veterinary Record,* 1910. See Fig. 6.

Francis Duck (1845-1934).
Taken from Smith's "*History of the R.A.V.C.*"



B. L. Glover (1848-1904).
Taken from *Vet. Jl.* May, 1904.

The Initial Phase. January-March, 1879

In a former paper (Curson, 1934), reference was made to the military veterinary surgeons taking part in the Second Sekukuni War, 1878. These were 1st Class V.S. Francis Duck, attached to the Frontier Light Horse, and V.S. Glover, who performed general duty. At the termination of the campaign these veterinarians proceeded to Utrecht (then in the Transvaal), where later was based the 4th Column,[4] and Natal respectively. According to a conversation with Sir Frederick Smith,[5] Glover was apparently attached to the 3rd Column which, later advancing into Zululand *via* Rorke's Drift, met with disaster at Isandhlwana (January 22nd, 1879). Although it is known that the Colonial Veterinary Surgeon for Natal, Samuel Wiltshire, M.R.C.V.S. (1844-1923), assisted the military, there is no evidence that a veterinary surgeon was attached to the 1st Column which was to invade Zululand along the coast.[6]

At that time, apart from other military literature, *e.g.*, *The Zulu Army*, there were available the following publications containing information of veterinary interest :—

(*a*) *Regulations for Field Forces in South Africa.* This, according to Norris-Newman (1880) gave details as to "horses, sick horse and remount depôts . . . cattle and other prizes . . . ." It probably incorporated (*d*) which follows. (*b*) *Suggestions for the General Management of Horses and Mules, while on Field Service in Natal and the Neighbouring Countries, with Notes concerning their more Common Ailments.* Again, according to Norris-Newman, this had a list of prescriptions as an appendix.[7] (*c*) A Report on Horse-sickness, which had been written by Samuel Wiltshire and published in the *Natal Government Gazette* of June 25th, 1878. And (*d*) *Regulations for the Organisation of the Lines of Communication of an Army in the Field.* These regulations, published in London by the War Office on June 1st, 1878, are explained in detail by Smith (1927, p. 166) and mentioned by Gudgin (1881).

While the above publications were no doubt helpful to officers of Imperial units, yet what was required was practical veterinary assistance, two veterinary surgeons for an army of 18,000 men with long lines of communication

[4]There were originally five columns distributed along the Zululand border, the plan of campaign being that these forces "should follow the routes converging on Ulundi," this being Cetywayo's chief military kraal. This account of the campaign is based upon the official *Narrative of the Field Operations Connected with the Zulu War of* 1879. Harrison & Sons, London. No reference is made to the infantry in this paper.

[5]At the R.C.V.S., February, 1926.

[6]A private practitioner, James Winter, M.R.C.V.S., was in Natal in 1874, but whether he had already proceeded to Australia (where he died in 1886) at the time of the Zulu War is unknown.

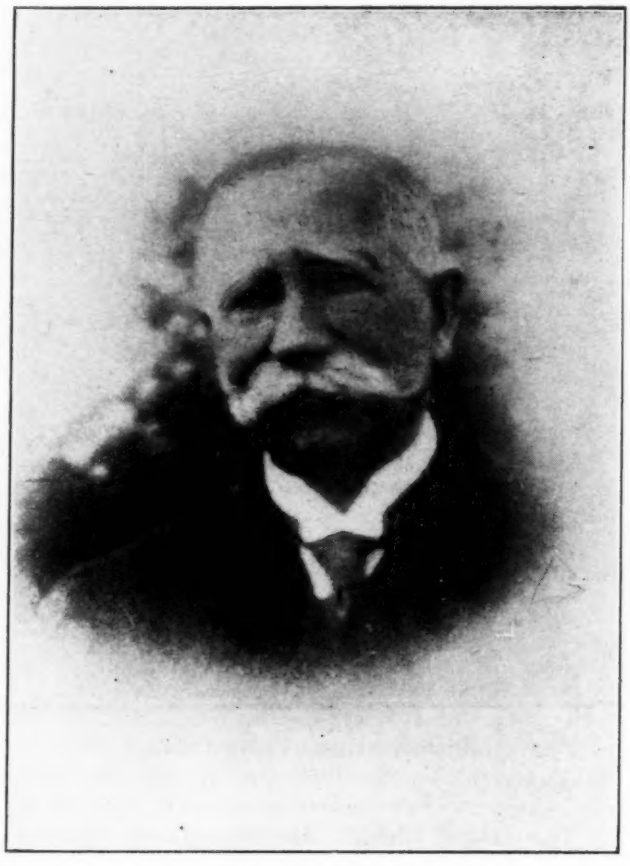
[7]This was a pamphlet by V. S. Glover. See abstract in *Vet. Jl.* viii, p. 97, 1879, which also refers to Wiltshire's *Report on Horse-sickness.* Apparently no copy of Glover's pamphlet exists.

J. D. Lambert (1835-1905)
Taken from *Vet. Jl.* May, 1905.

(distributed in several columns) being hopelessly inadequate.

As transport difficulties were particularly severe, it is as well to mention where railhead was. Along the North Coast the railway had reached Verulam, approximately 20 miles from Durban, the sea base, and about 45 miles to the headquarters of the 1st Column. Inland, *i.e.*, from Durban, the line had only reached Botha's Hill, about 30 miles distant. From Pietermaritzburg, the capital (40 miles further), the main wagon road passed *via* Ladysmith and Dundee to Rorke's Drift (the Greytown route being considered unsafe) and *via* Newcastle to Utrecht. As the rates were about £1 per ton from Pietermaritzburg to Greytown and £2 3s. to Helpmakaar, it will be seen that transport riding was a profitable business. In point of fact, it was the transport problem which caused Lord Chelmsford later to alter his original idea of invading Zululand by several routes.

In addition, the country except for the coastal belt, was rough, there being innumerable rivers which at that time of the year were generally



Samuel Wiltshire (1844-1923).

in flood, and therefore difficult to ford. In some places, *e.g.*, Tugela River, it was necessary to provide ponts for crossing. The roads or rather tracks to the frontier were impassable after heavy rain, while in Zululand itself, there were not even tracks for wheeled transport; in fact "no maps of the country existed (p. 13)."[8]

The transport figures for the first period of the campaign (p. 146) show a grand total of:—

Conductors, drivers and leaders ...	1,910
Wagons	977
Ox carts	56
Oxen	10,023[9]
Horses	803
Mules	398

Ox wagons, both Government and hired, formed the chief means of conveyance, but ox carts and lighter mule wagons were also employed. The ox wagons carried from 3,000—8,000 lb. whereas the lighter mule wagon carried about 2,000 lb. Owing to the season, the question of grazing for the transport oxen, 16 to a wagon,

[8]See *Narrative of the Field Operations Connected with the Zulu War of* 1879.

[9]It is interesting to note that at this period a virulent disease of cattle was raging in Madagascar and Mauritius. Importation of livestock from the East African coast and from the islands in question was accordingly forbidden both by the Cape Colony and Natal. (*Veterinarian*, liii. p. 808, 1879).

was not at first serious, but towards the winter, little grass remained, and cattle were consequently often half starved. In fact, "large numbers of animals perished" (p. 87), through this cause. When oxen were hired "an indemnity of £20 had to be paid by the British Government" (p. 87) for such losses. The daily ration for colonial mules, eight to a wagon, was 5 lb. of maize, and 5 lb. of oat hay, besides grazing. This was carried on the wagon.

The horses used by the mounted troops[10] numbered approximately 1,500. Those of the Natal Mounted Police and Natal Volunteers were probably private property. Remounts were purchased as a rule by officers detached temporarily from corps; but the Colonial Veterinary Surgeon also assisted, even proceeding to Pondoland on this duty.[11] Besides the horses of the N.M.P. and Natal Volunteers, there were mounted men from other territories, as well as R.A. including N/5 R.A.

Hostilities commenced on January 11th, when the Rorke's Drift Column crossed the Buffalo River and entered Zululand, but it is intended to deal with each Column individually, commencing with the Coastal Column under Colonel Pearson.

Colonel Pearson's force, advanced from the Lower Tugela River in two sections, the first on January 18th being accompanied by No. 2 Squadron M.I. (120 strong), the Natal Hussars, Stanger M.R., and Victoria M.R. (totalling 123), a detachment of R.A. and wagons. The next day the second section, accompanied by the Durban M.R. (60 strong) and 80 wagons, followed, the line of march skirting the base of the foothills as far as the Inyezane River, where, by bearing to the left, the ascent to Eshowe is made possible. At the Inyezane River the advance was contested, the Zulu attack (January 22nd, 1879) being repulsed with heavy losses. On the following morning Eshowe Mission Station was reached and preparations were immediately made for establishing a depôt. In the meantime, however, the disaster at Isandhlwana had occurred and the converging movement on Ulundi was accordingly abandoned; in fact, the road to the Tugela River was unsafe and as a siege threatened, the mounted men and native infantry were sent back to the Tugela (Fort Pearson) under Major Barrow, not only to economise provisions, but also because of the difficulty in stabling and feeding the horses.

As grazing for the transport oxen became scarce around Eshowe fort, it was decided to send about 1,000 oxen "in charge of their drivers, to reach the Tugela if possible" (p. 54). Nine hundred of these animals were soon in the hands of the Zulus and the remainder were compelled to return to Eschowe. With some horses left behind by Major Barrow, a small mounted detachment was organised. This did useful work, especially in protecting the remaining oxen. "Early in March the whole of the slaughter oxen were consumed, and the meat rations were now supplied from the lean carcases of the draught or 'trek' oxen. The meat ration was 1½ lb. at this time, but it was tough and innutritious, and the want of fatty matter was very severely felt" (p. 57). Fortunately with the first reinforcements from Great Britain a relief force was organised under Lord Chelmsford. This relieved Eshowe on April 3rd, having defeated the enemy at Ginginhlovu (in the Inyezane valley) the previous day. At this, Major Barrow was in command of mounted troops which in a charge gave a good account of themselves. The total strength of the relieving force was approximately 5,620 men (3,340 Europeans), but the transport arrangements had been greatly improved. Furthermore, only the most necessary supplies were conveyed, even tents being dispensed with.

During the general reorganisation in April, after arrival of the bulk of the reinforcements, this Column was strengthened and became known as Division I. It will receive further attention in the next section, the final phase.

The Rorke's Drift Column, under Colonel Glynn, crossed the Buffalo River on January 11th, and contained the following mounted troops: No. 1 Squadron M.I., N.M.P., Natal Carbineers, Newcastle M.R., together about 300 in number, N Battery R.H.A., and a rocket battery R.A., carried on pack mules. Accompanying this force were about 100 wagons. On January 20th, a halt was made at Isandhlwana, and as there was a strong body of natives some 10 miles south-east distant, troops were sent to dislodge them on the following day. Included among these were mounted volunteers and

[10] At this time there was not a single Imperial Cavalry regiment in South Africa, the only regular mounted troops being two squadrons of mounted Infantry originally formed in the 9th Kaffir War (1877-78). Lord Chelmsford had requested the War Office to send out cavalry, but this had been refused (Norris-Newman, p. 87). Of the several mounted volunteer corps, the only one which still exists is the Natal Carbineers. This was mobilised at the end of November, 1878.

[11] Samuel Wiltshire received the Zulu War medal (private letter dated February 9th, 1926, from his daughter). Wiltshire's duties in the campaign are gathered from a letter dated September 20th, 1879, written to the *Veterinarian*. See Vol. lii, p. 873. He had charge of a Remount Depôt from January 6th, 1879—September 3rd, 1879. He purchased about 3,000 horses and also attended to sick animals. Losses from lung-sickness and poverty were enormous, the roads being bordered with skeletons and the stench at some places was sickening. He adds: "I have done my best to induce the Government to carry out the laws and adopt regulations without success, but hope for better things some day." He mentions that "meat is getting very dear here," *i.e.*, Pietermaritzburg.

N.M.P., about 150 strong, four guns of N/5 R.A., and the M.I. The mounted men left at Isandhlwana camp consisted of 30 M.I., about 80 mounted volunteers and N.M.P. and two guns N/5 R.A. Unfortunately the camp was not prepared for defence and when attacked at noon on January 22nd by about 10,000 Zulus, the garrison of approximately 1,800 men was annihilated, over 1,200 men, including native troops, being killed. The mounted men who rallied around the camp commandant, Colonel Durnford, at first kept the Zulus at bay on the extreme right of the British line, but they were later outflanked and their retreat cut off. They, however, "held their ground gallantly like the companies of the 24th near at hand, but attacked from all sides by overwhelming numbers" (p. 38), they perished to a man. The guns of the R.A., too, fell into the hands of the enemy. In their retreat "a deep watercourse was reached, which proved impassable for vehicles, and here drivers and horses were assegaied, two officers and a sergeant alone escaping" (p. 37). Although Lord Chelmsford, who accompanied the force engaging the Zulus south-east of Isandhlwana, had received reports that the main camp was in need of succour; he, observing from a convenient hill . . . "that the tents were standing and that all was apparently quiet" (p. 41) concluded that they were unfounded.

The Zulus, flushed with victory, then advanced to the Buffalo River where, on the afternoon and night of January 22nd, in a storehouse at Rorke's Drift, there took place one of the most gallant incidents in British history. The post, strengthened by biscuit boxes and sacks of maize, was held by a "company of the 2/24th, about 80 strong, and some men of other corps, the total number . . . being 139, of whom 35 were sick in hospital" (p. 45). The next morning 400 dead Zulus were found outside the building. This epic feat undoubtedly saved Natal from the terrors of a Zulu invasion.

An excellent example of endurance in a Cape troop horse is recorded[12] in connection with the disaster at Isandhlwana. Captain Alan Gardner, 14th Hussars, a staff officer, after sending an alarm to the garrison at Rorke's Drift, "started for Utrecht, a distance of 80 miles. After having ridden the same animal . . . for many miles and after being 24 hours in the saddle, he says: 'I tried to get a fresh horse but could not, so rode on' and he reached his destination." Captain Gardner was over 36 hours in the saddle, rode altogether nearly 140 miles over rough country, and except for a few mouthsful of grass his horse had no rest or food.

As a result of the events of January 22nd, the Column was deprived of the whole of its transport and was consequently incapable of making any offensive movement. Shortly afterwards the M.I. and Natal Carbineers were sent to join the Utrecht Column, whose movements are now to be described.

It is believed V.S. Glover served on the lines of communication of the Rorke's Drift Column, and apart from the fact that he performed general duty, nothing is known of his movements.

The Utrecht Column under Colonel Wood contained at first the Frontier L.H., Piet Uys' Burghers, Weatherley's Horse, Ferreira's Horse, Baker's Horse, and 11/7 R.A.; but it was joined later by No. 1 Squadron M.I. and Natal Carbineers totalling about 700 mounted men. Between January 10th and 31st, this force was engaged in clearing the enemy from their strongholds in the mountainous country between the Black and White Umfolosi Rivers, west and north-west of Ulundi. At the end of January a new camp was established at Kambula and operations were extended still further northwards. All went well until March 28th, when Colonel Wood, in order to create a diversion on the west, so as to assist Lord Chelmsford in the relief of Eshowe, almost lost a party of about 700 men including 400 Europeans, under Lieut.-Colonel Buller at Hlobane. As it was, 92 Europeans were killed and seven wounded. Lieut.-Colonel Buller had succeeded in gaining the summit of Hlobane mountain, where he captured some 2,000 head of cattle, when he observed "a Zulu army, estimated at 20,000 strong, approaching the mountain from the south-east" (p. 75). Retreat was now imperative, the retirement being covered by the F.L.H., and as the mountain path was "barely practicable for men on foot" (p. 77), it can be realised in what an awkward position the horsemen were. When the descent was completed, "many of the men were dismounted, their horses having been lost by falling over the rocks, and if the fears which were entertained of an attack by the main Zulu army had been realised, a very serious loss must have ensued" (p. 77). Here fell the noble Piet Uys, the gallant leader of the Burghers who had been of such value to Colonel Wood. It was also here that V.S. Duck distinguished himself. Lieut.-Colonel Buller, in despatches dated July 5th, 1879,[13] states: "Be-

[12] *Vet. Jl.*, viii, p. 376, 1879. Letter from Robt. Ward, F.R.C.V.S.

[13] See *Vet. Jl.* ix, p. 439 (1879). From this we learn that although Duck was attached to the Frontier L.H., he was in veterinary charge of all mounted units. Smith (1927, p. 198) gives interesting facts about Duck, two being, (*a*) that he was recommended for the V.C. for his gallantry at Hlobane on March 28th, but this was refused "on the ground that he had no right to be there," and (*b*) that Duck encountered about this time a case of tea poisoning in a horse. See *Vet. Jl.* ix, p. 154, "Poisoning of a Horse by Tea," by F. Duck, M.R.C.V.S., Royal Artillery.

sides his great ability as a veterinary surgeon, Mr. Duck proved himself a very gallant soldier. He always accompanied me in all big patrols, whenever, in fact, there was a chance for his immediate services proving more useful in the field than in camp, and I had great pleasure in specially reporting him for gallantry displayed during the retreat from the Hlobane Mountain on March 28th, 1879, when, taking a dead man's rifle, he volunteered his services with the rearguard, and was of great assistance at a critical moment." Fortunately, however, the main body of the party reached Kambula camp, which on the following day (March 29th) was vigorously attacked by the Zulus. The mounted units again proved their value both during the attack and in the final retreat of the enemy.

The Final Phase. April-August, 1879

Reinforcements having arrived early in April, certain changes were made in the organisation of the forces for the invasion of Zululand.

The Coastal Column, which we have already described as having been strengthened, was called Division I and placed under General Crealock.

In order to "obviate all the evils of the heavy, slow and cumbersome ox-transport in such a deadly district, and over such heavy roads" (Norris-Newman, p. 185), a sea base was established at Port Durnford at the mouth of the Umlalazi River.

Everything was in readiness at the end of June for the advance to Ulundi, which incidentally was to be accompanied by Sir Garnet Wolseley, the new Commander-in-Chief. He arrived at Port Durnford on July 2nd, but owing to rough weather no landing could be effected between July 2nd and 4th, by which time the campaign had been decided by Division II (commanded by Lord Chelmsford) at the Battle of Ulundi (July 4th).

The only military operations during this period were the destruction of certain kraals along the Lower Umhlatuzi Valley,[14] which task was ably carried out, chiefly by Major Barrow with his mounted force of about 600 men.

The Division was broken up on July 22nd, although the use of Port Durnford was continued until early in August.

As to the veterinary arrangements, all we learn from Gudgin's Report is that a sick horse depôt was established at Fort Williamson, Lower Tugela (south bank); but "for sanitary reasons" it "was subsequently removed to Nonoti, near Fort Stanger." It is clear, however, that during the final phase at least two veterinary surgeons were present with Division I, for in regard to Horse-sickness, Gudgin mentions, "Veterinary Surgeon (1st Class) Healy, R. A.[15] saw many cases on the Lower Tugela line of communication, on the Umlalazi Plains near to Port Durnford . . . ." According to the *Vet. Jl.* (Vol. ix, p. 203), V.S. Killick was also present.

The coastal operations having been summarised, we may now discuss the main operations undertaken by Division II, but before doing so reference of a veterinary nature will be made to the reinforcements from Great Britain.

The Rorke's Drift Column, which had not functioned since Isandhlwana, was not reorganised. On the west, all troops in the Utrecht District, other than those attached to the flying column under Brigadier-General Wood, V.C., C.B., which was designated as "Brigadier-General Wood's Flying Column" (Norris-Newman, p. 172), constituted Division II, under General Newdigate and with base at Dundee. Most important of the reinforcements was a cavalry brigade consisting of the 1st Dragoon Guards and 17th Lancers under Major-General Marshall. Particulars with regard to other horsed units are tabulated as follows:—

Regiment	Officers and men	Horses	Ship	Embarked	Disembarked
1st D.G. ... ... half	325	270	*Egypt*	28.2.79	9.4.79
half	324	267	*Spain*	27.2.79	do.
17th Lancers ... ... half	317	263	*England*	26.2.79	6.4.79
half	305	264	*France*	24.2.79	11.4.79
"M" Battery, R.A.	173	92	*Manora*	21.2.79	22.3.79
"N" Battery	173	132	*Olympus*	24.2.79	31.3.79
30th Co., R.E.	202	46	*Palmyra*	27.2.79	5.4.79
Half "C" Troop, R.E. ...	177	109	*Borussia*	1.4.79	—
A.S.C.	208	150	*City of Venice*	25.2.79	30.3.79
A.S.C.	223	230	*Queen Margaret*	22.2.79	29.3.79

[14]In the large map accompanying Norris-Newman's book, tsetse is shown along the Umhlatuzi Valley, but according to Gudgin there were "no casualties from this cause during the war." (p. 15).

[15]Strangely, Healy is the only veterinary surgeon who was in the Zulu War mentioned by Gudgin, and his is the one name missing from Smith's (1927) list on p. 257. Subsequently both Healy and Killick contributed papers on horse-sickness to the *Veterinary Journal* (See Vols. xi and xii).

ZULU WAR, 1879.

VETERINARY DEPARTMENT

GENERAL REPORT

LONDON
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE
BY HARRISON AND SONS, ST MARTIN'S LANE
Printers in Ordinary to Her Majesty

(0833)

GENERAL REPORT OF THE VETERINARY DEPT., ZULU WAR.

(Title Page.)

Book (? Blue) of 26 pages and measuring 8 by 13 ins. (Library of South African Vet. Med. Assn.).

The total as shown overleaf is 1,823 horses, but according to Gudgin " the number of English horses landed at Durban or Simonstown . . . . amounted to 2,073." The casualties during the voyage (30-40 days) were 3·84 per cent.[16] and " the losses from all causes " from date of landing of first batch—March 20th, 1879—to the end of September were 16 per cent.

When it is considered that the animals were sent off in great haste in hurriedly fitted troop ships, the result is at once a credit to the newly-organised A.V.D.[17] The *Veterinary Journal* of June, 1879 (p. 407) states that " two horses died of sea sickness . . . . in the King's Dragoon Guards," and later to combat horse-sickness " every precaution was adopted for its prevention, and woollen nose-bags had been made for the horses to wear while the dew was on the grass." According to Lambert (1881) the 17th Lancers were supplied with flannel nose-bags, but he rightly ascribes the low mortality from horse sickness in his regiment to the fact that " it was not the season for it."[18]

For the supervision of the above horses there were twelve veterinary surgeons (plus the P.V.S.), but as indicated previously, those of the cavalry were purely regimental. Norris-Newman (p. 167) mentions that V.S. Morgan, R.A., arrived by the " Queen Margaret," V.S. Killick with the " City of Venice," and V.S. Hagger with the " Olympus."

The *Veterinary Journal*, ix, p. 34, 1879, mentions that V.S. Burt, R.A., was in charge of 420 mules transported from New York to Natal on the " Ontario." Only eleven died on the voyage.

On arrival at Durban, the infantry were at once sent forward, either to form Division I or II, but the mounted troops were encamped first near the Berea, sheds being provided for the sick and lame, and later moved to Cato's Manor, about five miles from Durban. After the horses

---

[16]Smith (1912-14) considers that delay in getting to sea, *e.g.*, ships embarking horses at *several* ports, is " one of the chief if not the chief, cause of the higher death rate among horses shipped from " Great Britain (p. 262).

[17]The organisation of the A.V.D. compared well with that of the Army Medical Department, concerning which the *Army and Navy Gazette* (*Veterinarian*, lii, p. 573, 1879) commented most adversely. Norris-Newman also remarked on the superiority of the regimental system over that of the departmentalised Army Medical Service.

C. Phillips (1851-1895).
Taken from *Vet. Rec.* June 9th, 1934.

[18]The suggestion regarding the use of flannel nose-bags was made to Lord Chelmsford by Dr. Atherstone who not only had made " many *post-mortems* on horses " dead of horse-sickness, but had used nose-bags with success in the Cape Colony! See Order published by His Excellency at Pietermaritzburg in February, 1879 (*Veterinary Journal*, ix, p. 34).

had improved in condition, the cavalry, N/6 R.A. and two companies A.S.C. proceeded by easy marches *via* Ladysmith and Dundee to Landman's Drift on the Buffalo River. "M" battery R.H.A., R.E., and the remainder of the A.S.C. joined Division I.

Before the advance to Ulundi, *i.e.*, the main operation, was undertaken by Division II, "the plan originally entertained of an independent advance on the part of Wood's column . . . . had been . . . . relinquished, and in order to co-operate with Division II . . . . a movement to the southward was made by Wood's force on . . . . May 5th, and the position occupied at Kambula since January 31st was finally abandoned" (p. 100). As it had been decided that Division II should advance along the route Kopje Alleen —Itelezi Hill and Tombokala—Ityotyosi Confluence, Brigadier-General Wood accordingly marched south, and at the beginning of June came up with Division II at the Tombokala—Ityotyosi Confluence. Having heard that Cetywayo had given instructions that British Columns were only to be attacked when moving, General Wood on this march practised the formation of two wagon enclosures, "about 500 yards apart, in which the draught animals were secured, and it was found that the time necessary for the completion of this work was only 35 minutes" (p. 101).

From this point the operations of Wood's Column and Division II were combined, the former, however, taking up the leading position. Before describing later events, reference must be made to the unfortunate circumstances attending the death of the Prince Imperial on June 1st, just before the Division II and Wood's Flying Column met. The Prince had been granted permission to serve in the Quarter-Master-General's Department, Division II, and one of his duties was the selection of camping grounds, after the country ahead had been reconnoitred. On June 1st, accompanied by a small escort, he rode to the Ityotyosi River where after off-saddling, the party enjoyed a short rest. Soon afterwards, a Zulu having been seen, the horses were saddled up and preparations made for departing. Just as the Prince gave the word "mount" "a volley was fired at the party by a number of Zulus who had crept unobserved through the long grass" (p. 94). This being quite unexpected, "the troopers, not yet settled in their saddles, could hardly control their horses" (p. 94). The Prince's charger, being exceedingly restive, broke away from him before he could mount, with the result that he was killed shortly afterwards. This particular animal, a police horse, was selected by the Prince Imperial, although Mr. Samuel Wiltshire "begged him not to choose that one, as he said it was a fidgetty beast and would not stand when being mounted . . . . The Prince, however, seemed to fear lest he should be thought wanting in pluck and insisted on having this horse."

About this time, May 28th, 1879, Lieut.-General Sir Garnet Wolseley was appointed not only G.O.C., but also Governor of Natal, Lord Chelmsford, however, continuing in command of the combined columns until the middle of July.

The further line of advance of the combined forces was in the direction of Emtonjaneni (Melmoth) *via* Babanango. For the protection of the line of communication to the Zulu border General Marshall was detached with all the regular cavalry except three squadrons of the 17th Lancers, under Colonel Drury-Lowe, which were to accompany Division II. On June 27th, Emtonjaneni was reached, and here an interview was held between messengers from Cetywayo and Lord Chelmsford, who had previously made it clear "that before any terms of peace could be discussed" (p. 97), the oxen captured at Isandhlwana and all arms taken during the war, were to be returned. The messengers had brought with them 150 head of cattle, which they stated were "all that could be collected, the rest having died of lungsickness" (p. 111) but, "with the exception of the two guns captured at Isandhlwana, which were on their way, the arms demanded could not be surrendered, as they were not in the King's possession" (p. 111). It would, however, appear that Cetywayo was anxious to make peace, for he sent his herd of white cattle as a peace-offering to Lord Chelmsford, but his warriors intercepted them and they were driven back to Ulundi.

Ulundi was now only 16 miles distant and Lord Chelmsford decided that troops, lightly equipped and with rations for ten days, should advance on June 30th. The rations were carried in ox wagons, while the regimental reserve ammunition was conveyed in mule carts. In the subsequent operations leading to and during the Battle of Ulundi, the mounted men of the Flying Column under Colonel Buller did splendid work, especially in commencing the battle. The combined forces crossed the White Umfolosi River early on the morning of July 4th, and advancing in a hollow rectangle, were attacked at 9 a.m., the mounted men under Buller thereupon retiring within the rectangle, where were also the regular cavalry. In 25 minutes the Zulu attack had wavered owing to the destructive fire of the infantry and artillery. The 17th Lancers were then ordered "to engage the enemy, and Colonel Drury-Lowe, leading out his men through . . . . the rear face of the rectangle, charged the Zulus . . . . and in this pursuit the efficacy of the lance as a cavalry weapon was abundantly proved" (p. 116). The mounted men, under Colonel Buller, then issued from the front of the

rectangle and completed the rout. Cetywayo had left Ulundi the previous day, and his army, after this defeat, scattered in all directions.[19] News of the victory was conveyed by a telegram sent off by Mr. Archibald Forbes of the *Daily News*, who rode the 110 miles from Ulundi to the frontier (? Landman's Drift) in 14 hours.

After Ulundi and other military kraals in the vicinity had been destroyed, the troops returned to Emtonjaneni on July 6th. The Flying Column accompanied by Lord Chelmsford then marched south to St. Paul's Mission Station, just north of the Umhlatuzi River, where it was finally broken up. Division II returned along the route taken during the advance until near Babanango mountain, where a camp was formed. Here after a week's rest, "the horses (now getting 10 lb. of oats daily) and oxen improved considerably in condition" (p. 124). Finally, at the end of July, the Division ceased to exist. The 17th Lancers were ordered to hand over their horses to the 1st D.G. at Kopje Alleen,[20] and then dismounted, they proceeded to Durban where they embarked for India.

As the capture of Cetywayo was considered imperative, Sir Garnet Wolseley organised two new Columns, under Lieut.-Colonel Clarke and Lieut-Colonel Baker Russell, which were to search for the king in northern Zululand. After a search lasting a month Cetywayo was captured on August 28th in Ngome Forest by a party detached from Lieut.-Colonel Clarke's Column. In this incident a squadron of the 1st D.G. under Major Marter did excellent work. In the meantime, Lieut.-Colonel Baker Russell had scoured the mountainous western border, and after hearing of Cetywayo's capture, he entered the Transvaal and was soon busy preparing for the Third Sekukuni War.[21]

After peace had been restored at the beginning of September, British troops were withdrawn from Zululand, some units being sent to the Transvaal. Included among these were the 1st D.G., whose veterinary officer was Mr. Robert Moore.

Veterinary Organisation

We have seen that a great improvement, especially from a veterinary point of view, followed reorganisation after Isandhlwana. Whereas there were only two veterinary surgeons for probably 15,000 animals during the first part of the campaign, there were 14 veterinary surgeons (excluding the P.V.S., whose headquarters was at Pietermaritzburg) for approximately 30,000 animals employed later.

Regarding mortality, no figures are available for the initial phase, but according to Gudgin (1881) the following losses occurred during the final phase: Of approximately 3,000 mules, the mortality amounted "to about 8 per cent." Of 2,073 English horses, as mentioned before, "the losses from all causes" represented 16 per cent. "About 4,250 Colonial horses were purchased for the Zulu War," but the mortality is unknown. It could not have exceeded the figure just given. Of the 36,000 oxen used "before, during and since this campaign . . . . about 10,000 died."[22]

Robert Moore
Veterinary Surgeon, K.D.G.

[19]According to Norris-Newman (p. 318) the total casualties among horses at Ulundi was 71. Approximately 1,350 horses were present.

[20]Some of the mares used by the Imperial troops were sold by auction and realised good prices. According to *The Quarterly Journal of Veterinary Science in India*. p. 213 (1882-3) about 650 mules were taken by V.S. (1st Class) Duck *via* Aden to Bombay as a nucleus for a mule transport corps.

[21]Besides Curson (1934), see *Veterinary Journal*. xi, p. 319 (1880), regarding mortality in the Third Sekukuni War from Horse-sickness.

[22]According to the earliest of Wiltshire's Annual Reports *available, viz.*, 1880, stock diseases were exceedingly prevalent after the campaign, as is usually the case.

The average price paid for colonial horses and mules was £23, but shipping charges and commission brought the figure for Cape mules to approximately £33. About 2,140 mules were purchased in South Africa.

Reference has already been made to the late Samuel Wiltshire purchasing remounts in Pondoland, but purchasing parties scoured the entire country. Accompanying one of these was V.S. Seaward Longhurst, who observed and recorded in the "*Field*" (see *Vet. Jl.*, xxv, p. 307, 1892), a case where a bird had built its nest in the tail of a grey horse purchased in the Orange Free State!

For the reception not only of fresh remounts but also sick horses, depôts were established at Durban (for equines arriving from England, North America, Monte Video and Cape Colony), Pietermaritzburg, Dundee, Ladysmith, and Utrecht. The commandant of the Remount establishment was Major J. C. Russell, 12th Lancers, with headquarters at Pietermaritzburg; but apparently there was much room for improvement in selecting remounts, as this matter is stressed by Gudgin on p. 12 of his Report. Otherwise he appeared satisfied with the depôts themselves; indeed, he states that the instructions given under ***Regulations for the Organisation of the Lines of Communications*** " leave little or nothing to be desired."

Gudgin (1881) in referring to the stamina of Colonial horses, mentions that in October, 1879 " the horses of N/5 R.A. marched—bringing their guns (7-prs.) with them—from Heidelberg to Pietermaritzburg, a distance of 320 miles, in 14 days . . . . and when sold the following week realised within a pound a head their cost price." He also states that the weight of man and kit in the volunteer corps was approximately 13½ stones.

Valuable information regarding transport is given in Appendix E of the official *Narrative of the Field Operations connected with the Zulu War*. The Director of Transport was Commissary Elmes, whose headquarters was Pietermaritzburg. Undoubtedly the greatest losses of cattle were due to redwater and lungsickness, and Gudgin emphasises (p. 9) that "The services of officers belonging to the Veterinary Department could be utilised with great benefit to the transport and enormous saving to the public. These officers have received a training which especially qualifies them for the supervision of cattle as well as horses . . . ." According to the *Vet. Jl.*, June, 1879, p. 407, the oxen were dying "literally by hundreds of the disease called 'red-water.' In one convoy that left Maritzburg for Greytown, 43 out of 120 oxen died on the way." In such circumstances heavy losses due also to exposure during the winter months can be readily understood.

"Tulp" poisoning also occurred, the 17th Lancers losing some horses at Landman's Drift. Material sent to England for determination formed part of the subject of a paper, "Poisonous Plants in Zululand and Afghanistan," by George Fleming (*Vet. Jl.*, x, p. 65, 1880). The outbreak referred to above was witnessed by V.S. F. Raymond who, from India (then V.S. to 17th Lancers), wrote that he "found nothing so effective as tulip charcoal and aromatic spirits of ammonia given together" (*Vet. Jl.*, xii, p. 288, 1881).

Lambert in an article "*Sore Backs*" *among Army horses* (*Vet. Jl.*, xii, p. 169, 1881) refers to sore-backs as common among horses of the colonial troops. He preferred a good blanket (as used by the 17th Lancers) to a numnah.

Gudgin's most important recommendation is in connection with the extension of "the services of Veterinary Officers," *e.g.*, by appointment to boards (*a*) purchasing livestock and foodstuffs, (*b*) in dealing with claims "preferred by civilians for losses in horses and cattle," and (*c*) "by placing them in veterinary charge of cattle depôts and farms."[23]

Through *post-mortem* examinations veterinary surgeons were able to save the State thousands of pounds, for it was part of the contract "that the owners should receive compensation for all the animals that died of lung-sickness." Compensation of course was claimed for every one; but the result was decided as just mentioned, by *post-mortem*. (*Vet. Jl.*, p. 378, 1882).

The approximate cost of the Zulu War was £5,230,323 (p. 174).

The following veterinary surgeons participated in the campaign: Principal Veterinary Surgeon T. P. Gudgin, F. Duck, W. Burt, G. H. Fenton, B. L. Glover, W. R. Hagger, M. F. Healy, T. A. Killick, J. D. Lambert, S. Longhurst, R. Moore, J. W. A. Morgan, C. Phillips, F. Raymond and W. B. Walters. Of the above, we not only know that Longhurst (1st D.G.), Lambert (17th Lancers), Hagger (R.A.), Duck (Frontier L.H.), and Raymond accompanied Division I, but that Lambert, Hagger, Duck and Raymond were present at Ulundi, Lambert being slightly wounded.

Smith (1927, p. 168) states "there was much feeling when the war honours . . . . came out

[23]Believing that horse-sickness was anthrax, Duck and Glover sent blood from Natal to the P.V.S. in London for microscopic examination. Fleming, who reported on the samples, naturally did not find *B. anthracis*, but in Glover's' specimen (mixed with aqueous humour from a sheep's eyeball) detected a filaria, which, however, did not surprise Fleming! Other material supplied to Dr. Greenfield of the Brown Institution was injected into mice which Wiltshire states (Govt. Not. 228, *Natal Government Gazette*, May 30th, 1882) contracted the disease!

and nothing fell to the Veterinary Department.[24] He adds that " two executive officers received the thanks of H.R.H. the Commander-in-Chief for their services in that campaign (*i.e.*, Zulu), or rather series of campaigns." These could only be Messrs. Duck (whom we have seen was specially mentioned in Colonel Buller's Despatch—in the *London Gazette* of July 5th, 1879) and Glover, who had taken part in the 9th Kaffir (1877-8) and 2nd Sekukuni (1878) Wars. Smith states that " it was not until the following year that the P.V.S. (*i.e.*, Gudgin) . . . . was granted a good service reward of £50 a year."

He does not mention that Glover was promoted to be Veterinary Surgeon, First Class, for his services in South Africa (*Vet. Jl.*, xi, p. 289).

According to the *Veterinary Journal* (viii, p. 317, 1903) the following veterinary officers were mentioned in despatches after the Zulu War: Gudgin, Glover, Burt, Hagger, Healy, Lambert, Longhurst and Walters.

A medal with clasp was issued to those participating in the campaign. Curiously, the names of Fenton and Moore do not appear in the *Veterinary Journal*, just mentioned, as having received this award.

References

Curson, H. H. (1934.) Veterinary affairs in the Transvaal during the first Annexation, 1877-1881. *Vet. Jl.* 90. pp. 64-73.

Gudgin, T. P. (1881.) *General Report, Veterinary Dept., Zulu War*, 1879. 26 pages. Printed by Messrs. Harrison & Sons, for Her Majesty's Stationery Office. Republished in *Vet. Record* in 1910.

Smith, F. (1912-14.) *A Veterinary History of the War in South Africa* as supplements from 1912-1914 in *Vet. Rec.*

Smith, F. (1927.) *A History of the Royal Army Veterinary Corps*, 1796-1919. Baillière, Tindall and Cox, London.

Norris-Newman, C. L. (1880.) *In Zululand with the British in* 1879. Wm. Allen & Co., London.

Lambert, J. (1881.) Horse Sickness or Anthrax in South Africa; its Nature, Causes, Prevention, Symptoms and Treatment. *Natal Government Gazette*, Nov., 1881, p. 704.

——. (1881.) *Narrative of the Field Operations connected with the Zulu War of* 1879. Printed under the Superintendence of Her Majesty's Stationery Office.

[24]See *Vet. Jl.* x. p. 181. 1880.

ARMY VETERINARY SERVICE

London Gazette—War Office—Regular Army

Reserve of Officers

Maj. T. Bone, o.b.e., having attained the age limit of liability to recall, ceases to belong to the Res. of Off. (Dec. 29th).

The Veterinary Record

January 5th, 1935.

GREETINGS AND GOOD WISHES FOR THE NEW YEAR FROM THE PRESIDENT

To all members of the National Veterinary Medical Association I send the best of good wishes for the year 1935.

In the retrospect, 1934, like some of its predecessors, has not been a year of unmixed blessing to all members of the profession. Veterinary practice, which occupies the attention of the large bulk of the profession, has been adversely affected by the depression in trade and agriculture, and its scope is being threatened by the proposed introduction of new organisations intended to control a few of the more prevalent diseases. It is, however, accepted that the veterinary practitioner provides an essential service for the stockowner, and anything which may be introduced to curtail the activities of the practitioner will reduce the attractions of practice and the numbers engaged in practice. The general veterinary service required for animal husbandry will thus be rendered totally inadequate. Such a calamitous and retrograde step the National Veterinary Medical Association are doing their utmost to prevent.

For a considerable period now the outlook of the veterinary science has been undergoing a process of change. Veterinary activities are being directed more and more to preventive medicine, but even these activities can never be expected to prevent the ordinary accidents and ailments of livestock for which the veterinary practitioner will be required.

Veterinary research, on the other hand, is coming into its own, and is receiving increasing and well-deserved encouragement and it may be claimed for it that it has already more than justified all the provisions that have been made for its development. The fruits of research are largely concerned with the prevention rather than the cure of disease. The field of veterinary public health is rapidly expanding and attracting many members by reason of the lucrative appointments offered.

The prospects of the profession in the future are evidently rosy if one judges from the number of students now entering the veterinary schools.

One of the notable features of the past year has been the appearance of an additional teaching centre of veterinary science, which has been created at the University of Cambridge. It will thus be seen that the depression of the year 1934 has not been without its bright intervals.

Looking to the future, I earnestly hope that the changes which may eventuate in 1935 will bring in their train success, health, and happiness in large measure to all the members of the National Veterinary Medical Association.

To strengthen the Association, may I finally suggest three good New Year's resolutions, to comprise:—

1. Unstinted loyalty to the Association.
2. An endeavour to increase its membership.
3. Determination to provide a larger number of clinical contributions to this journal.

J. F. Craig.

Clinical Communications

"ACTINOMYCOTIC" MASTITIS

GWILYM O. DAVIES, M.R.C.V.S., M.V.Sc. (Liv.), D.V.H.,
Department of Veterinary Pathology, University of Liverpool

Although text books on pathology, medicine, meat inspection and allied subjects frequently refer to actinomycotic mastitis in the cow and even go so far as to consider the suitability of milk produced by such cows for human consumption on the ground of the transmission of infection, the writer has failed to find any indisputable record of a case of actinomycotic mastitis, that is, *Actinomyces bovis* infection, in the cow's udder.

Numerous cases of actinomycosis have been described but, in such instances, the diagnosis has been based merely on clinical examination, the demonstration of clubs in histological sections or the finding of filaments in smears of milk sediment. In such cases, cultural examinations have either not been attempted or have failed to demonstrate the presence of *Actinomyces bovis*. Following a statement by the writer on a previous occasion that actinomycotic mastitis probably did not exist, details of cases together with isolated cultures were sent by other observers. In no case was it possible to confirm the presence of *Actinomyces bovis* (Israel and Wolff).

There are, however, numerous instances on record in which lesions simulating actinomycosis have been encountered in the bovine udder but which have proved on bacteriological examination to be a chronic mastitis caused by a staphylococcus, a condition resembling very closely that known as botryomycosis in the horse. In the udder conditions, however, the colonies with their clubs were identical with those of true actinomycosis except that the organisms contained in the centre of the granules differed.

The naked-eye appearances of the udder lesions are, however, not always distinctive and in many cases they are suggestive of tuberculosis.

The literature on "actinomycosis" in the bovine udder in which the identity of the causative organism has been established by bacteriological examination includes three cases by Magnusson (1928) who also cites eight cases examined by Hulphers (1920) and 20 cases by Gunst (1927) all of which are attributed to staphylococci. More recently we have the detailed records of 26 cases in Victoria by Albiston (1930) and two cases in U.S.A. by Hilton Smith (1934) who also showed a staphylococcus to be the responsible agent. Albiston and Pullar (1934) state that out of 117 cases of actinomycosis of the udder examined in Victoria during the last few years, 115 were found due to infection with staphylococci. Of the other two cases, one was actinobacillosis and the other an infection with an unidentified streptothrix.

So far as Great Britain is concerned, there seems to be no record of the occurrence of the staphylococcal lesion in cattle. The case which is now to be described, although detected in Birkenhead, occurred in an eight-year-old Canadian cow and was detected in the course of routine meat inspection.

Apart from this condition in the udder there were no lesions to be found in the rest of the carcase even though a very exhaustive examination was conducted at the time in order to gain some information as to the probable nature of the mastitis. All four quarters were affected. They were enlarged and of firm consistency. On cutting the tissue, the appearance was identical with that associated with actinobacillosis in the substance of the tongue. Numerous discrete nodules up to $\frac{3}{8}$-in. in diameter were present in the mammary tissue and in the freshly-cut organ they stood out prominently from the intervening tissue. Each nodule was enclosed in a dense band of fibrous tissue and was of a brownish colour, in contrast with the pale-yellow, silky appearance of the apparently unaffected gland tissue. The substance of each nodule resembled a sponge and consisted of numerous intercommunicating spaces which were occupied by a minimum of pus containing well-defined, easily crushed, yellowish granules. These granules could be seen quite clearly with the naked eye in some of the uncut nodules.

Smears prepared by crushing the granules revealed nothing but Gram-positive cocci of varying size, with no indication of filaments or bacillary forms such as are to be found in smears of actinomycotic material.

Material obtained by crushing granules was sown ærobically and anærobically on to the customary media and in all cases a pure growth of *Staphylococcus pyogenes* was obtained in 24 hours.

Sections prepared from the tissue revealed

ILLUSTRATING "ACTINOMYCOTIC MASTITIS" BY GWILYM O. DAVIES

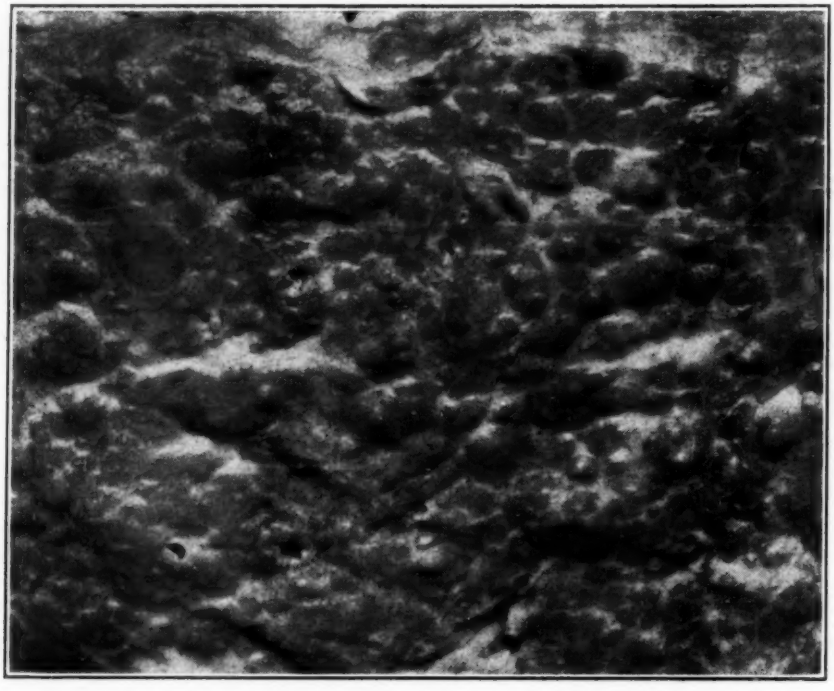


Fig. 1.—Mammary Gland of Cow showing nodular lesions caused by *Staphylococcus pyogenes.*

Fig. 2.—Section of mammary gland showing colony stained by Hæmalum and Eosin. X 25.

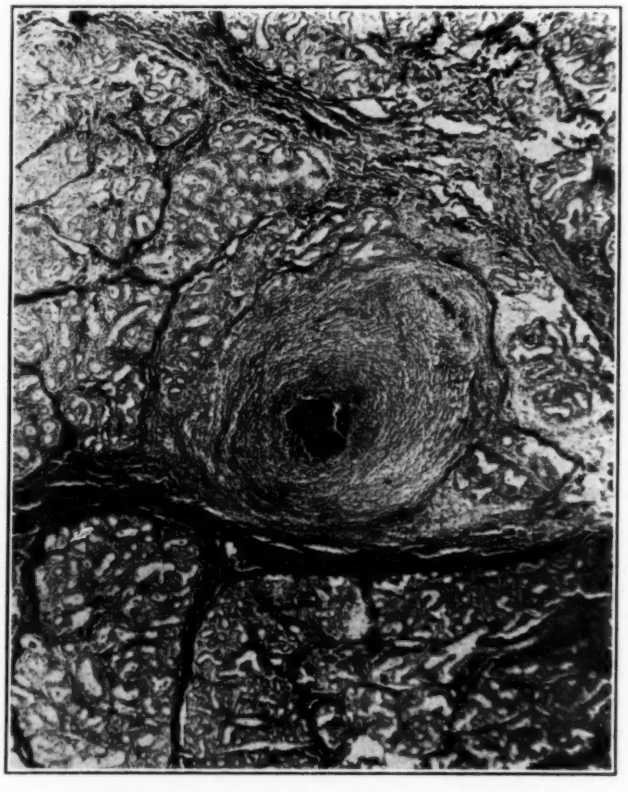


Fig. 3.—Section of colony showing peripheral layer of clubs and groups of staphylococci in the centre. Stained by Hæmalum and Eosin. X 600.

the appearance conveyed in the accompanying photomicrographs. Under low magnifications areas of mammary tissue with compressed and distorted alveoli were interspersed with well-defined nodules encapsulated with fibrous tissue. The substance of the nodules consisted of fibrous tissue, fibroblasts, a zone of leucocytes and in the centre one or more colonies of the organism surrounded by a palisade of acidophile clubs. Within the clubs was to be seen a homogeneous structureless groundwork in which were masses of cocci visible under the $\frac{1}{12}$-in. objective.

Generally speaking, the histological appearance was that of a typical actinomycotic nodule, except that the centre of the colonies contained cocci instead of a network of radiating filaments.

All recent investigations point to the fact that the term actinomycosis as applied to lesions in the udder is a misnomer and as in the case of "wooden-tongue" in cattle we are called upon to revise our terminology. Actinomycosis and actinobacillosis are ætiologically distinct diseases and, as the condition commonly referred to as "actinomycosis" of the udder is not ætiologically related to either of these conditions it behoves us to adopt some other name. Although one is hesitant to add to the already bewildering list of diseases, it will doubtless be conceded that some clarification with regard to the subject of actinomycosis of the udder is urgently necessary. To this end, Bosworth (1930) suggested the use of the term botryomycosis. This name with its termination—mycosis—does not appear to the writer to be a very suitable one and is likely to add to the confusion which already exists, seeing that it is already in general use to designate a staphylococcal granuloma in equines. This disadvantage may, however, be considered to be of minor importance in view of the identical ætiology of the two conditions. Colebrook (1930) suggested the term actinophytosis, but this does not appear to have met with approval.

In view of the close clinical and histological relationship between this form of mastitis and actinomycosis and actinobacillosis in other parts of the body, it does seem advisable to preserve the relationship and yet at the same time to clarify the ætiological position. With this in mind it is suggested that the staphylococcal lesion, which has been described above and of which there are at least 170 cases on record, should be called *actinococcosis*. This term has the advantage that, in addition to indicating the occurrence of actiniform clubs as in actinomycosis and actinobacillosis, it also defines clearly the nature of the causal agent. There would thus be three distinct ætiological conditions :

Actinomycosis due to *Actinomyces bovis*,
Actinobacillosis due to *Actinobacillus lignièresi*,
Actinococcosis due to *Staphylococcus pyogenes*,

all of which have been, and are being confused under the term actinomycosis.

The writer is indebted to Mr. H. Burrow, M.R.C.V.S., D.V.S.M., for the tissue referred to in this article.

References

Albiston. (1930.) *Austral. Vet. J.* *6*. 2.
Albiston and Pullar. (1934.) *Austral. Vet. J.* *10*. 146.
Bosworth. (1930.) *Vet. Rec.* *10*. 590.
Colebrook. (1930.) *Ibid.* 589.
Magnusson. (1928.) *Acta Pathol. et Microb. Scandin.* *5*. 171.
Smith. (1934.) *J. Amer. Vet. Med. Ass.* *84*. 635.

AN EXPERIENCE WITH TUBERCULIN IN THE TREATMENT OF BOVINE PNEUMONIA

JOHN WEIR, M.R.C.V.S., D.V.S.M.
Veterinary Department, County Offices, Hamilton

During the past few years I have been particularly struck with the beneficial influence that concentrated tuberculin would appear to have in certain cases of bovine pneumonia. My attention was first drawn accidentally to its influence when I was asked to examine a newly-calved heifer under the Tuberculosis Order. After the usual examination I was unable to make up my mind whether the animal was suffering from miliary tuberculosis or pneumonia, and as a result decided to apply the double intradermal and intrapalpebral tuberculin tests. The animal looked like dying, and I had grave doubts as to her surviving till the test was completed. Two days later I revisited the farm and found the cow markedly improved and showing no reaction to the tests. I saw this animal several times at subsequent visits, when she always appeared in perfect health. The owner stated that she gradually improved after the application of the tests and received no subsequent treatment whatever. At the time I was so struck with the sudden improvement that I wondered if the tuberculin was in any way responsible. Since then I have had eight similar experiences. In no case was there any reaction to the tuberculin and in each instance there was a marked improvement which continued until recovery was complete, after the injection of tuberculin.

Tuberculin, of course, is used with beneficial results in certain cases of tuberculosis in the human subject. I am convinced, however, that none of the cases to which I refer had tuberculosis, since, apart from the fact that the tuberculin tests were negative, the symptoms exhibited only suggested miliary tuberculosis, recovery from which is impossible. I have only had the opportunity of making a *post-mortem* examination in one of these cases. This par-

ticular animal, newly bought by the owner' behaved exactly as the case I have quoted in detail. A year later it developed symptoms of pneumonia again and was slaughtered. On *post-mortem* examination almost the whole of the lung tissue was found to be affected with pneumonia from which a strain of *Bacillus coli* was isolated. Two small, active, pea-like nodules of tuberculosis, one in the lungs and the other in a mediastinal gland, were found. It is probable that these had developed since the date of the test a year before.

Perhaps nine cases are not a sufficient number upon which to base a definite opinion, but the improvement has been so marked, I may almost say spectacular, that it would seem as if the tuberculin were in some way responsible.

THE MUSK RAT IN GREAT BRITAIN

In a brochure entitled "The Distribution of the Musk Rat in the British Isles," Mr. Tom Warwick, of the Bureau of Animal Population, Department of Zoology and Comparative Anatomy, Oxford University, makes reference to the first importation of musk rats in 1929 for fur-farming, to the escape and spread of animals from several centres, and to the various measures adopted for control. The musk rat, he writes, will be an expensive member of the British fauna for several years to come. All the control campaigns began work on a more or less large population of animals. At Pulborough and Farnham, where trapping began in March and May, 1933, respectively, the heavy initial catches soon slumped. Musk rats had been caught since then, and the last obtained in either area was trapped at Pulborough in May this year. In Ireland the monthly catches had shown a remarkable drop from the beginning. No musk rats were caught there from early May, 1933, to July. It is known that there are musk rats still at large in all these areas.

In Shropshire, such was the size and density of the musk rat population that, though a staff of trappers was appointed in June, 1932, catches did not show any material reduction until May, 1933. This infestation, the largest and densest in the British Isles, has been very materially reduced in area and extent. The Severn is now the only part of the country which is colonised. There is the danger, however, strengthened by the existence of an outpost at Linley for two year, of colonies being established on the Severn many miles below where the present surveillance ends.

It may be said of all the campaigns that it has not proved a matter of difficulty to reduce materially the density and area of infestation. It is, of course, impossible to prevent musk rats from migrating, and a constant watch on places from which musk rats are thought to have been cleared is necessary. It is considered likely that many musk rats escaped from musquash farms formerly kept in the country. The holders of licences to keep musk rats during the year ended April 1st, 1933, were obliged to destroy them by that date. A year or two usually elapses between the escape of musk rats and the establishment of colonies dense enough to attract the attention of the public. Sufficient time, therefore, has not yet elapsed to make sure that other parts of England do not contain infestations.

Abstracts

[**Gas Œdema Diseases.** Scott, J. P. (Associate Professor of Animal Pathology, Department of Pathology, Division of Veterinary Medicine, Kansas State Agricultural Experiment Station, Manhattan, Kansas, U.S.A.). Paper No. 11, Twelfth Internat. Vet. Congress, New York, 1934. *Author's Summary.*]

Gas œdema diseases are divided into—

A. General diseases: Blackleg, bacillary hæmoglobinuria, and black disease;

B. Diseases involving chiefly the intestinal tract: Bacterial diseases (braxy, grass disease, lamb dysentery, and struck) and bacterial toxæmias (pulpy kidney disease and infectious entero-toxæmia).

Blackleg filtrates and ana-cultures (bacterins) treated with formaldehyde, acetaldehyde, and merthiolate have greater aggressive strengths than products treated with phenol, chlorpicrin, or phenyl-mercury nitrate.

Bacillary hæmoglobinuria is primarily a cattle disease although it occasionally occurs in sheep and has been observed in a hog. It is characterised by high fever, depression, rapid hæmolysis of red blood cells, hæmoglobinuria, and bowel hæmorrhages. The most characteristic lesion is the large liver infarct. A sporulating anærobic bacillus, *Cl. hæmolyticum*, is believed to be the cause of this disease. Pathogenicity for experimental animals is dependent on the presence of an unstable hæmolytic toxin. An antiserum used before extensive destruction of red cells occurred resulted in recovery of about 65 per cent. of the animals treated. A phenol-killed whole-culture bacterin affords protection to cattle for from four to six months. A more enduring protection is derived from glycerinated live vaccine.

Black disease is an acute, highly fatal disease of sheep, occasionally of cattle. It is shown to be due to the germination of latent spores of *Cl. novyi* which have been carried to the liver by wandering liver flukes. Black disease is controlled by active antifluke measures and by the use of ana-cultures.

Braxy is characterised by the development of intense inflammation of the abomasum. *Cl. septicus* has been consistently isolated from the lesions. Toxin-antitoxin mixtures and ana-cultures have been used successfully.

Grass disease is a disease of young lambs, the chief lesion being an inflammation of the intestines from which *Cl. septicus* has been isolated.

Lamb dysentery is a disease of young lambs, characterised by a brownish diarrhœa. On autopsy numerous ulcers are found in the intestinal tract. A virulent strain of *Escherichia coli* and a toxic organism of the *Cl. welchii* group

have been isolated. A vaccine made from the colon organism and toxin-antitoxin mixtures produced from the lamb dysentery bacillus have proved of value.

Struck is an acute infection or toxæmia of sheep characterised by ulceration of the intestinal tract. This disease is caused by *B. paludis*.

Pulpy kidney disease is an acute disease of young lambs in which a pulpy condition of the kidneys develops soon after death. Infectious entero-toxæmia is a similar condition of fat lambs six or more months old. These diseases are shown to be due to *B. ovitoxicus* toxins.

Classification of Cl. noryi. It is suggested that *Cl. noryi* organisms be divided into: *Cl. noryi* type A—the classical glycerol-fermenting organism including *B. œdematiens*: *Cl. noryi* type B—the organism producing black disease and the *B. gigas* of Zeissler, slightly larger than type A and which does not ferment glycerol; *Cl. noryi* type C—the apparently non-pathogenic organism isolated by Kraneveld, from bacillary osteomyelitis of buffaloes.

Classification of organisms resembling Cl. welchii. Cl. welchii type A—the classical *Cl. welchii* of gas gangrene. This type is divided into four cultural groups (1, 2, 3, 4) and produces a single toxic factor W; *Cl. welchii* type B—the lamb dysentery organism, does not ferment glycerol or inulin, produces toxic factors W, Z, and X; *Cl. welchii* type C—*B. paludis* ferments glycerol but not inulin and produces toxic factors W and Z; *Cl. welchii* type D—*B. ovitoxicus* ferments glycerol but not inulin and produces toxic factors W and X.

* * * * *

Bovine Tuberculosis and B.C.G. Vaccination.

Watson, E. A. (Chief Pathologist, in collaboration with Drs. C. W. McIntosh and H. Konsi, Animal Diseases Research Institute, Health of Animals Branch, Department of Agriculture, Hull, Quebec, Canada.). Paper No. 6, Twelfth Internat. Vet. Congress, New York, 1934. *Author's Summary.*]

B.C.G. vaccination of new-born calves has been practised and studied in a tuberculous herd of dairy cattle. The investigation has extended over a period of ten years, during which over 100 cattle have been used in a comparative study of the susceptibility and resistance of vaccinated and unvaccinated animals equally exposed to natural modes of infection. Ninety of these cattle, consisting of 54 vaccinated with B.C.G. and 36 unvaccinated controls, have been necropsied at the end of trials of varying duration.

The incidence of tuberculosis in the aggregate was exactly the same in the vaccinated and unvaccinated cattle (83·4 per cent.). In 15 animals (16·6 per cent.) no evidence of tuberculosis was found. Eight of these were under one year of age and seven were from one and a half to two years of age.

The average degree of tuberculosis was less in the young, immature animals but greater in the maturing animals in the vaccinated class than in the unvaccinated, and in the aggregate was nearly the same for each class with a slight but insignificant difference in favour of the vaccinated.

The anatomic distribution of the disease shows a location of glandular and pulmonary tuberculosis in the vaccinated cattle very similar to that in the unvaccinated or without any significant differences.

The pathology, in the gross, shows in the vaccinated cattle a marked trend towards caseous, caseo-purulent, and exudative processes, with appreciably less fibrosis than in the unvaccinated group in which the caseo-calcareous type of lesion is in a great preponderance.

There is a noticeably greater trend towards pathologically progressive changes in the lesions manifest in the B.C.G. cattle, but the total area and extent of tuberculous tissues involved or destroyed do not appear to be greater and, on the whole, may even be less than in the unvaccinated cattle.

The critical age is from two to four years or between puberty and maturity. It is then that increased relative resistance attributable to B.C.G. vaccination is seen to fail rapidly and to disappear.

Allergy is discussed in its relationship to the pathology of chronic tuberculosis, and the question is raised as to whether it is an asset or a liability in prophylaxis and tuberculo-immunity. Pre-allergic B.C.G. vaccination of calves and the resulting state of allergy and post-allergic revaccinations have not afforded adequate protection against infection and typical tuberculosis developing either from or in the presence of primary tuberculosis in the large majority of cattle so treated.

* * * * *

Immunity Against Animal Parasites.

Cameron, T. W. M. (Research Professor of Animal Parasitology and Director of the Institute of Parasitology, McGill University Montreal, Canada.). Paper No. 10, Twelfth Internat. Vet. Congress, New York, 1934. *Author's Summary.*]

The resistance mechanisms of the body against animal parasites do not appear to differ in principle from those evoked against bacteria and viruses, but their method of attack, which is discussed, is so different that their manifestations are often altered considerably. Moreover, present knowledge of the subject is still fragmentary and confusing. It seems possible, however, to summarise our present knowledge in the following terms:

Animals are naturally immune to parasites of physiologically unrelated animals, although a

few worms, namely, *Fasciola*, *Trichinella*, and the larval stages of *Echinococcus*, appear to have very wide physiological requirements. Under certain circumstances, natural immunity may be broken down.

Animals are naturally tolerant to the effects of their own parasites, but this tolerance can be easily broken down by adverse factors. They are much less tolerant to abnormal parasites.

Animals often become premune to their own parasites; this premunition may be broken down by unnatural factors, such as lack of food, overcrowding, other parasites, and so on. This premunition is a common method of resistance to Protozoa; we are less sure of its operation against Metazoa.

Animals are sometimes susceptible to parasites proper to physiologically related animals: an age resistance is often shown to these as it is to other abnormal or recently introduced species. The evidence for breed immunity is still very scanty.

There is little evidence yet of a true acquired immunity against adult helminth parasites, and although *Theileria* produce a sterile immunity and the Coccidia may do so, in general, premunition is the usual means of resistance among the Protozoa. In practice, an artificial premunition can be produced only against *Babesia*.

It seems probable that hypersensitiveness is a normal defence reaction of the body. The phenomenon has been successfully used in diagnosis.

Some of the serological changes observed appear to have no necessary connection with defence reactions, but some have. There is no evidence (with the doubtful exception of *Sarcocystis*) that any of the animal parasites produce a true toxin, and the "foreign proteins" introduced by them into the body are probably normal secretions and excretions. If antibodies produced in response to normal secretions inhibit their actions, they may well prevent parasites from securing and digesting food and consequently act as a mechanism of resistance. Other antibodies, especially in the Protozoa, act by interfering with reproduction, possibly in a somewhat similar way. The eosinophiles, evoked in response to the presence of foreign proteins, seem to play an active, but as yet improperly understood, part in the defence against metazoan parasites and their effects.

* * * * *

Veterinary Control of the Milk Trade. von Ostertag, R. (Ministerial Director [Retired], Tübingen, Germany. Paper No. 56. Twelfth Internat. Vet. Congress, New York, 1934. *Author's Summary.*]

Wholesome milk can be derived only from healthy cows. Therefore, veterinary milk control is a necessary requirement for the official regulation of the control of the marketing of milk.

Veterinary control of milk animals is to be carried out at frequent intervals in herds producing certified and grade-A milk; the control is to be supplemented by regular microscopic, bacteriologic, and histologic examination of milk samples in veterinary laboratories.

For the prevention of the transmission of tubercle bacilli through milk, at least the exclusion of all milk animals which are affected by udder tuberculosis or open pulmonary, uterine, or intestinal tuberculosis must be required.

The question of transmissibility of *Brucella abortus* (Bang) to man through milk needs further clarification as to the extent of danger.

Milk is not to be considered injurious in cases of European streptococcic mastitis caused by *Streptococcus agalactiæ*, in contrast with the American mastitis caused by *Streptococcus pyogenes*. It is sufficient to exclude from consumption milk which examination shows to have undergone changes and to enforce the processing of milk containing microscopically detectable pus; milk which shows few abnormal cell elements may be marketed without limitation.

The infection of milk animals with bacteria of the paratyphus-enteritis group commands the greatest attention of veterinary milk control because cow's milk containing such organisms as the result of local (udder, intestine, or uterus) or systemic infections is likely to be injurious to human health.

* * * * *

Leptospirosis Ictero-hæmorrhagiæ (Weil's Disease) in the Dog. Klarenbeek, A. (Veterinary Faculty, State University, Utrecht, Holland.). Paper No. 4, Twelfth Internat. Vet. Congress, New York. 1934. *Author's Summary.*]

Weil's disease, or leptospirosis ictero-hæmorrhagiae, frequently occurs in dogs in Holland. This disease is of importance from the standpoint of comparative medicine, for leptospirosis corresponds morphologically as well as biologically with the disease in man. Infection of man by dogs must be considered possible. From the standpoint of veterinary medicine, this disease is of importance because the variable symptoms of the disease and the prominence of the disturbances of the liver and kidney make difficult a differential diagnosis between this and other diseases. For this reason, in many instances of internal disease it will be necessary to make an examination for leptospira.

* * * * *

Neurolymphomatosis Gallinarum. Dobberstein (Director, Pathological Institute, Veterinary High School, Berlin, Germany.). Paper No. 42, Twelfth Internat. Vet. Congress, New York, 1934. *Author's Summary.*]

Neurolymphomatosis is a disease with a wide

range of distribution. It has been encountered on all the continents, except Australia. The average loss in the flocks affected varies between 10 and 25 per cent., but may be as high as 60 per cent. About 4 per cent. of all the poultry deaths in Germany are attributed to neurolymphomatosis.

Neurolymphomatosis is decidedly a disease of pullets. It occurs most frequently from August till October. Older chickens contract the disease very seldom. It runs, as a rule, a chronic course. The affected pullets will linger for weeks and months.

The clinical picture is characterised by the occurrence of spastic and relaxed paralyses, especially in the region of the extremities. The observation of a disturbance of equilibrium, of respiratory disturbances, of paresis of the ingluvies, and of disturbance of vision, has been noted in some of the cases.

The nature of the disease consists of a peculiar interstitial neuritis, myelitis, and encephalitis, in the course of which, starting at the mesenchyma of the vessel wall, considerable new formation of cells of varying character will take place. The new formation may assume a tumour-like character in some of the cases.

There seem to be certain connections between the infectious fowl leukosis of Ellermann and neurolymphomatosis. The relations are not yet well understood.

Neurolymphomatosis can be transmitted artificially from one animal to another. Intestinal parasites and dietary deficiencies, however, do not play an etiological rôle.

It seems to be highly important to encourage the study of the relationship between fowl leukosis and neurolymphomatosis.

* * * * *

[Two Cases of "Actinomycotic" Mastitis. Smith, H. (1934.) *J. Amer. Vet. Med. Ass. April*, 1934.]

On account of their rarity the author felt justified in describing in full two cases of this disease. One cow was the daughter of the other. In the first instance a mild mastitis was observed in one hind quarter. After twelve months both hind quarters were affected, enlarged and hard and there was some heat and pain, although no disturbance of general health. On cultural examination staphylococci and streptococci were found and the leucocyte count was very high. Amputation was performed, but the animal died in five days showing signs of toxæmia. The forequarters were normal but the hind ones were composed almost entirely of spherical or irregularly-shaped, encapsuled lesions from 3 to 10 mm. in diameter. The substance appeared granular to the naked eye.

The microscopical appearance, which was typical of that seen in *actinomyces bovis* infections, is illustrated and described.

The author concludes with a brief survey of actinomycosis and allied conditions.

N. S. B.

[Davies points out, in another part of this issue, that all the cases so far described as actinomycotic mastitis which have been examined bacteriologically have proved to be due to staphylococci.—Ed., *V.R.*]

* * * * *

[The Epidemiology of Parasitic Gastritis in Sheep. Observations on the relative importance of the various factors concerned in the development of the disease. Taylor, E. L. (1934.) *Jl. Agric. Sci. 24.* 2. 192-208. (8 refs.)]

Taylor gives an account of a preliminary investigation into the epidemiology of parasitic gastritis in sheep, the results of which suggest that valuable information may be derived from a continuation of the observations. The details of nine outbreaks are tabulated and briefly discussed.

The importance of observations of natural outbreaks as compared with experimental infections is that, in the former, all the various factors concerned in the development of the disease may be studied, whereas, in the latter, some factors may accidentally be excluded.

Taylor shows that there are two main types of outbreaks. One, which is dependent on a heavy residual infection in the soil, is generally more or less acute, and may occur in lambs as young as nine to ten weeks. It is confined to arable land and particularly concerns *Ostertagia*. The second type, "auto-infection," is usually less acute—taking longer to develop—and is seen in lambs on permanent pasture towards the end of summer.

Outbreaks are shown to occur at different seasons in different parts of the country, the deciding factor probably lying in the system of farming and not the age of the lambs. It appears that lambs of only nine to ten weeks may suffer severely from Ostertagiasis, the larvæ of which may reach the infective stage in less than seven days in sufficient numbers to cause an acute outbreak. With regard to the survival of infective larvæ in the soil, it is recorded that in the case of *Ostertagia* these may regain the surface after having been buried by the plough, and may survive in dangerous numbers for eight to ten, or possibly up to twelve, months. Optimum conditions for the acquisition of larvæ are considered to exist in the grazing of bare pastures.

While it is well known that there may be an increased susceptibility to parasitic worms resulting from an inadequate or deficient diet, it is also shown that where infestation is high, extra feeding may be of little value.

J. S. S.

[**A Note on the Development of *Fasciola hepatica* and an Outbreak of Acute Liver Rot.** Stewart, W. Lyle. (1934.) *Vet. J.* *90.* 10. p. 403.]

Reference is made to the gradual elucidation of the causation of liver rot in sheep and to the complicated life history and development of *F. hepatica*, and the author states that it was not until 1915 that Ssinitzin's work provided the missing link. This worker proved that the young flukes leave the alimentary canal shortly after they are ingested. After wandering and feeding in the peritoneal cavity of the host, they finally migrate to the liver, which they enter by puncture of its capsule. This being so, it can be anticipated that they sometimes cause an acute disease, with symptoms quite distinct from the chronic malady generally produced by infection with *F. hepatica*. Such an outbreak of acute liver rot is described. Following sudden death of prime young ewes, *post-mortem* examination showed that death was due to liver hæmorrhage, the blood finding an exit into the intestine *via* the bile duct. The liver was extensively damaged and inflamed, and minute punctures denoting points of entry of the cercariæ were detected. The sheep had recently been moved to pastures previously stocked with sheep, and presumably heavily loaded with encysted cercariæ. As a result of many cercariæ migrating at or about the same time, the liver was extensively damaged by multiple punctures almost simultaneously produced. The rapid course of the disease was suggestive of anthrax.

W. L. S.

* * * * *

[**Chronic Copper Poisoning in Sheep.** Bisset, N. (1934.) *Vet. J.* *90.* 10. p. 405.]

The meagre literature on the above subject leaves it debatable whether or not domestic animals ever suffer from chronic copper poisoning, and Lander is quoted as stating that the detection of copper in the liver and kidneys is no evidence of copper poisoning. This article records periodic losses of sheep on a farm within the industrial area of South Wales, under circumstances suggestive of chronic metallic poisoning. The symptoms were dullness, emaciation and, in every case, hæmaturia prior to death. *Post-mortem* examinations showed liver degeneration, and the colour of this organ varied from brownish yellow to orange. The kidneys were enlarged and inflamed. There were also gastro-intestinal catarrh and thickening of the intestinal mucous membrane. Two livers chemically examined showed 59 and 25 mgms. of copper, or about 40 times an amount previously recorded by Nunn as "comparatively large." Arsenic was absent, but is not entirely ruled out, and the case is still under investigation. Mortality was observed at the commencement of the recent severe droughts.

W. L. S.

[**Dogs and Human Migrations** (Concluded from a preceding number). Gwatkin, R. D. S. (1934.) *J. S. Afri. V.M.A.* *5.* 1. pp. 29-40.]

5.—The Second Dog of Antiquity—Canis pallipes

The wild dog of Australia or dingo has always been looked upon as an importation by man. According to Sollas (1924, Ancient Hunters) it is closely related to the Indian dog, *C. pallipes*. Similar dogs existed in Europe during the bronze age, and fossilised bones have been found in W. Victoria. It is therefore a very ancient intruder from Asia, as are the pariah dogs of the East Indies and the Pacific Islands.

Some authorities hold the wild dog of India to be the chief ancestor of modern dogs, while others favour *C. poutiatini*, as found in a post-glacial deposit in Russia. The latter is wolf-like, but has great elevation and width of skull compared with present or extinct wolves. It is closely allied to the dingo and also to *C. tenggerranus* (the half-wild dog of Java) and it may have been one of the ancestors of Neolithic dogs of Europe.

C. pallipes of India is, next to the kitchen-midden type, the most widespread in nature.

Large dogs of the *C. poutiatini* Studer type have not been found in pre-bronze age times in Europe. They were at this period carried by man "from the Pacific to the Hesperides," being the prototype of the shepherd dog and very widely dispersed.

6.—The Third Dog of Antiquity—Canis simensis

Western Europe derived this dog in Neolithic times from Egyptian sources where they were held in high esteem. It is of the greyhound type, and was first depicted in the Fourth Dynasty (3,500 B.C.) and now commonly called the "Fox-dog." Its ears are erect, body slender, legs long and lean, and tail, non-bushy, curled over its back. Very slightly modified descendants exist in Crete and the Balearic Islands to-day. (Ancient coast-hugging mariners passed such isolated islands by.)

It is suggested that the *C. simensis* of Abyssinia and N. Africa may be the Egyptian greyhound run wild, and that the relative lateness of the species in Egypt can be explained either by the discovery of a pre-existing *C. simensis* by the Egyptians, or both the Egyptian greyhound and *C. simensis* may have been derived from early Dynastic imports from Asia (probably Turkestan). The Borzois of the Russian Steppes, the Persian and the Afghan greyhounds, are three derivatives.

Lankester links up *C. simensis* with the S. American types *C. jubatus* and *C. antarcticus*, the latter two aberrant types probably being carried across the Pacific by the bringers of Central American culture.

7.—The Fourth Dog of Antiquity—Canis molossus

This embraces the mastiff breed. Its Asiatic source is attested by its being introduced into Egypt as Asiatic tribute; its early representation in Indian sculpture; its intensive cultivation by Assyrians; as being thought worthy gifts to Alexander during his Indian Expedition; and finally, the persistence in Thibet of the wild forms as Thibetan wolves (*C. laniger* and *C. niger*). This fundamental type has been well cared for, interbred and developed since Assyrian times, and the attention paid to fancy types plus unavoidable intermixtures in Mesopotamia, Egypt, Rome, etc., has produced many breeds.

8.—A South African Dog Immigrant from Asia

A dog, now known as the Rhodesian Ridgeback or "Lion Dog," was found among the Hottentots when Europeans first visited South Africa. It is like a jackal in general conformation, but its characteristic feature is that the hair along its spine is turned forwards. There seems no doubt that the Rhodesian breed (now much improved) originated in the Cape, but followed in the train of traders and hunters to Rhodesia. The author quotes instances of this, although the original breed is no longer to be found in the Cape.

Its counterpart can be found on a small island, Phu-Quoc or Fu-Oc, in the Indo-China Seas. The breed must have been brought from the East as the Hottentots were not navigators. It is known that the Chinese and other Eastern nations were navigating the Indian Ocean for a long period before the tenth century down to Marco Polo's time, and probably these and other dogs were then introduced to South Africa (probably all South African dog and jackal types were so introduced). This may also account for the Mongolian characteristics of the Hottentot race.

Nature reported the finding of a canoe made of Malayan wood in Algoa Bay a few years ago.

The Asiatic dogs *C. sumatrensis* and *C. scylax* were small fox-like dogs, intermediate between the wolf and jackal. The ridgeback seems to have been a characteristic that emerged from one of these Eastern breeds.

C. V. W.

The National Sheep-breeders' Association will hold their 34th International Conference at Newcastle-on-Tyne on July 1st, 1935, when Mr. O. Stinson, president of the Dumfries and Galloway Division of the N.V.M.A., will read a paper. Mr. Frank Fawcett, who represents the Herdwick Society, has been elected president for 1935.

Municipal Report

CITY OF SALFORD

ANNUAL REPORT OF THE MEDICAL OFFICER OF HEALTH: VETERINARY INSPECTOR'S DEPARTMENT

The duties undertaken by the Veterinary Department can be considered under three separate headings:—

(1) Diseases of Animals Acts and relative Orders.
(2) Milk Control.
(3) Meat Inspection.

Diseases of Animals Acts

There were 18 cases of scheduled diseases dealt with, comprising 17 outbreaks of swine fever and one of tuberculosis. Several cases of suspected anthrax were investigated, but in every case the result was negative.

Forty-two notices were received from the Customs Officer that ships were in the Salford Docks with dogs on board. The ships were visited to ascertain that the dogs were controlled in accordance with the provisions of the Importation of Dogs and Cats Order of 1928.

The number of milk cattle permanently kept in Salford is small, but Salford is an important distributing centre for cattle to south-east Lancashire, and the licensing and supervision of imported cattle and sheep are an important part of the duties of the Veterinary Department. In 1933, 1,387 licences were issued authorising the movement of 16,380 cattle and 30,847 sheep.

Of the 17 outbreaks of swine fever reported, 16 were found in carcases of pigs killed in one of the slaughterhouses. A total of 104 carcases were destroyed on account of this disease.

Milk Control

The percentage of tuberculosis in the raw milk as it is received into this city is still an unsatisfactory feature. Three hundred and sixty samples of farm milk were examined, and 38, or 10·5 per cent., of the samples contained tubercle bacilli. This percentage is the highest for some years. The subsequent examinations of the cattle on the positive farms resulted in 34 cows being slaughtered under the Tuberculosis Order, 1925, by the respective local authorities.

Seventeen samples of "pasteurised" milk were examined and gave negative results. In the case of eight of the "pasteurised" samples, the inoculated guinea-pigs were kept for twelve weeks before being killed.

One hundred and fifty-two samples of milk were examined for bacterial content. These were chiefly samples of milk sold under the

Milk (Special Designations) Order, 1923, but also included samples of farm milk, and samples taken in testing the efficiency of a new type of "pasteurising" plant. The test showed that the milk, after "pasteurisation," had a much lower bacterial content than the raw milk. One sample of raw milk had a bacterial content of over 5,000,000 organisms per c.c. and *Bacillus coli* was present in 1/1,000 of a c.c.—after "pasteurisation" the bacterial content of this milk was 300 organisms per c.c. and coliform organisms absent in 1/10 of a c.c.

Two samples of milk taken before "pasteurisation" produced lesions of tuberculosis in guinea-pigs after three weeks, but two samples of the same milk taken after "pasteurisation" failed to produce tuberculous lesions in guinea-pigs after six weeks.

There are 766 persons registered as retail purveyors of milk in this city. The distribution of milk received considerable attention, particularly the cleansing of returned milk bottles. The importance of this is emphasised and several cleansed bottles were tested. Twenty such bottles were tested, and of these only eight were found to be sterile and nine were distinctly dirty. This is in spite of the fact that all the bottle-washing dairies have a steam sterilising outfit. On investigation it was found that either the sterilising temperature was not sufficiently high, or that the length of time the bottles were exposed to heat was not sufficiently long.

Considerable attention is given to the small mixed businesses selling a small quantity of loose milk. For some years now, an effort has been made to confine such shops to the sale of bottled milk only. In 1929 there were 471 shops selling loose milk, and 222 shops selling bottled milk. The figures for 1933 were 237 shops selling loose milk and 539 shops selling bottled milk. It is pointed out that in order to remove a person from the register of retail purveyors of milk, the procedure prescribed by the Milk and Dairies (Amendment) Act, 1922, is carried out. This is very slow, the average time taken to remove a person being six weeks. Seventeen retail purveyors of milk attended before the Health Committee to show cause why they should not be removed from the register.

Meat Inspection

A total of 31,846 animals were killed in the slaughterhouses. A table is given, showing a list of 34 diseases under which meat was condemned—58·6 per cent. of the total amount of meat condemned was affected with tuberculosis.

There are seven licensed private slaughterhouses and one public slaughterhouse in this city.

A register of retail butchers is kept, and all such shops are visited. All food-preparing premises, including bakehouses, tripe works, and places where meat products are made, and also offensive trades are under the supervision of the Veterinary Department.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Jan. 7th.—N.V.M.A. Committee Meetings. Meeting of the Derbyshire Division, N.V.M.A., at Nottingham.

Jan. 8th.—Meetings of Committees and Council, N.V.M.A.

Jan. 9th.—R.C.V.S. Committee Meetings.

Jan. 10th.—R.C.V.S. Committee Meetings.

Jan. 11th.—R.C.V.S. Committee and Council Meetings.

Jan. 14th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4 p.m.

Jan. 17th.—V.V.B.F. Ladies' Guild Dance.

Jan. 18th.—Meeting of the Mid-West Division, N.V.M.A., at Bristol.

Feb. 6th.—R.C.V.S. Voting Papers issued to members overseas.

* * * * *

"N.V.M.A." MOTOR INSURANCE SCHEME

As announced in our last issue, the increased rates of premium for motor insurance which the large majority of Insurance Offices are now imposing, do not apply to "N.V.M.A." policies, which will continue to be issued at the present printed schedule rates of premium, without regard to the district in which members reside or use their cars.

* * * * *

THE NEW YEAR HONOURS

From the standpoint of the veterinary profession the list of Honours this New Year is chiefly remarkable for its omission of the names of any of its members—a singular and surely unjustifiable state of affairs—but at least we can join with his military confrères in sincerely congratulating Major-General George Fleming, C.B.E., D.S.O., the son of the renowned member of the profession of that name, in the conferment upon him of the C.B.—a distinction which his father also held.

General Fleming, who now occupies the position of Commander, Madras District, Southern Command, India, was promoted Major-General on relinquishing command of the Shanghai Area in 1933.

The profession will also welcome the recognition of his outstanding services to agriculture which has been given to Mr. John Boyd Orr,

Director of the Rowett Institute for Research in Animal Nutrition, Aberdeen, who with Dr. E. B. Poulton, Emeritus Professor of Zoology at Oxford, joins the select company of Knights Bachelor, while we are pleased to note that the new baronets include Sir Holburt Waring, President of the Royal College of Physicians, and that the General Secretary of the national organisation of our good friends the farmers—Mr. Cleveland Fyfe—receives the C.B.E.

* * * * *

LADIES' GUILD DANCE

The energetic Hon. Secretary of the Victoria Veterinary Benevolent Fund Ladies' Guild is, as will be observed from our Notices column, following the excellent example set in recent times by the supporters of the Fund in the North, in arranging a dance for its benefit at Prince's Galleries, Piccadilly, on January 17th. Mrs. Nickinson, our readers will regret to learn, underwent a serious operation last month, but was able to rejoin her family for Christmas, and we trust that a large number will be present at the Dance to congratulate her on her restoration to health and to support the object she has so much at heart.

* * * * *

FOOT-AND-MOUTH DISEASE IN WILTSHIRE

The existence of foot-and-mouth disease among pigs at Castle Eaton, Wiltshire, was confirmed last week-end.

The area subject to restrictions in the movement of animals lies in Wiltshire, Gloucestershire, Berkshire, and Oxfordshire.

* * * * *

OBITUARY

Death of Professor Dr. Franz von Hutyra

[Preliminary Notice]

The whole world of veterinary science will mourn the loss of Hofrat Dr. Franz von Hutyra, the eminent pathologist, which took place on December 20th, 1934, after an illness of over a year's duration, at his home in Budapest.

Professor von Hutyra, who was 69 years of age, was elected an Honorary Associate of the Royal College of Veterinary Surgeons in July, 1914. Rector for a period of ten years of the Veterinary High School at Budapest, Dr. Hutyra enjoyed an international reputation as a veterinary authority, and his death leaves a great gap in the ranks of our research workers. It will be remembered that at the time of the International Veterinary Congress in London, in 1930, he held the exalted position of President of the Permanent Commission of International Veterinary Congresses.

Dr. Hutyra was, of course, joint author with Dr. Joseph Marek of the famous "Special Pathology and Therapeutics of the Diseases of Animals" which, with its translations, is used as the standard text-book in veterinary colleges throughout the world, and the third edition of which, in three volumes, appeared in 1926.

* * * * *

THE LATE MR. HUGH ANDREW

An Appreciation

We have received the following appreciation of the late Mr. Hugh Andrew, M.R.C.V.S., of the Borough, S.E., notification of whose death appeared in our last issue.

* * * * *

Hugh Andrew died on December 15th, 1934, after a long and trying illness. To his friends his passing, at the early age of 49 and in the prime of life, came as a great shock. Especially was this so inasmuch as, with his usual reticence and thought for others, he had fought his battle alone, not wishing to give trouble or anxiety to anyone.

As one who had the great privilege of calling him friend, I feel that I cannot let the occasion pass without, in some small measure, paying a tribute to his memory and recording my thanks for the blessings of my cherished friendship with a noble character.

Andrew, a true Scot, came to London soon after graduation in 1906, joining the old and important veterinary business of F. T. Stanley in the Borough and in due course becoming its principal. He soon became a true son of the ancient Borough, steeped in its history and tradition and, like his loved friend William Willis, almost Dickensonian. Of a fine bearing, blunt, outspoken and strictly honest, he would speak his mind without fear or favour. He stood for all that is best in veterinary matters and he was possessed of a very fine interpretation of professional etiquette. The following incident, related to me by the commander of a depôt of one of our great religious organisations, was typical of the man.

A young man, at present practising in London, bought a practice which included numerous good horse contracts. One of these contracts was that of a religious body. Andrew was approached with a view to taking over this work. The young man was as then unknown to him but Andrew's anger at the thought that the young man was likely to lose the work without fair trial knew no bounds. He immediately sought the commander and in no uncertain terms told him what he thought of him for attempting even unwittingly such a mean trick. The result was that the youngster was given a trial and made good. The commander has personally told me that he many times had felt thankful for Andrew's rebuke. If space were available I could tell of many more incidents of such a nature—how he "helped lame dogs over stiles," and how he endeared himself to all with whom he came in contact. He loved his work and its associations, his home, his books and his staff. His last thoughts were for the welfare of his staff and it is pleasant to think that they will continue their service under the youngster whom he so nobly defended.

He was laid to rest at Norwood, on December 19th—as he had lived, without fuss or ostentation—in the presence of his sisters and his cousin Archibald Andrew, M.R.C.V.S., and a few friends.

The profession was represented by Messrs. McCunn, Somer and Balls.

He has left his friends strengthened by his presence and ideals, and cherishing a precious memory.

J. McCunn.

SEX DETERMINATION OF CHICKS

Prior to the Recess, Mr. Henderson Stewart, in the House of Commons, asked the Secretary of State for Scotland whether, in view of the increasing adoption of sex determination of chicks by large poultry firms in England and the almost complete absence of the system in Scotland, he will take steps to make the method known to Scottish poultry producers, with a view to encouraging the most scientific and profitable methods in Scotland?

Sir G. Collins replied that the subject had been brought to the notice of the agricultural colleges in Scotland, and he understood that arrangements were being made made whereby a method of distinguishing the sex of day-old chicks would be demonstrated to county instructresses in poultry-keeping, at an early date.

* * * * *

HUNTER AND PONY SHOWS

At the Thoroughbred and Hunter Show which takes place on the Tuesday, Wednesday and Thursday, March 19th to 21st, the grants for light horse breeding from the War Office and from the Racecourse Betting Control Board will be awarded, and some 68 thoroughbred stallions will be allotted premiums of £125 each. These stallions will have to travel specified routes in all counties, and serve the farmer's half-bred mares at £2 a time.

In the Hunter Section of the show, £1,000 will be awarded for hunter young stock and for riding horses. A wide range of classes are available with first prizes of £20 and £15, while a new introduction is a special prize of £25 for the thoroughbred stallion siring the first prize group of three young hunters, provided such winning stallion is one exhibited for a King's Premium at the show. Jumping will take place each afternoon.

At the National Pony Society's show, which follows on the Friday and Saturday, March 22nd to 23rd, all types of ponies will be on exhibition in the 51classes. In addition to 12 polo breeding classes and nine classes for ridden polo ponies, there will be sections for Welsh and Shetland ponies. The Arab Horse Society are also providing eight classes for Arab horses. A new feature will be the class for polo ponies trained and owned by a serving soldier. The popular polo-bred hack class, to be ridden by a lady, is again included. The two new classes for miniature Shetlands should also prove attractive.

The young enthusiast will without doubt be a strong supporter of the Pony Show, as five classes have been provided for children of all ages. These will be judged in the afternoon, which each day will conclude with an attractive gymkhana programme.

The Editor acknowledges, with thanks, the receipt of the following:—

Report of a meeting of the Lancashire Division, N.V.M.A., from Mr. A. L. Mullen, Hon. Secretary.

Report of a meeting of the Eastern Counties Division, N.V.M.A., from Mr. H. P. Standley, jun., Hon. Secretary.

Communications from Mr. D. J. Anthony (Brierley Hill), Captain H. L. Torrance (Nottingham), and Mr. R. E. Glover (Cambridge).

ADVERTISER'S ANNOUNCEMENT

Messrs. A. Fleming & Co. (Succrs.), the well-known suppliers of all classes of Surgical Equipment, have removed from 39, Victoria Street, London, S.W.1, to much more convenient premises at 51, Mortimer Street, London, W.1 (Tel. : Museum 6292), where splendid ground floor showrooms have been acquired.

The excellent values offered to readers of the *Veterinary Record* by this firm from their well-assorted range of second-hand and Government surplus stock are too well known to require emphasis, but it may be mentioned that all the latest types of aseptic furniture and surgery equipment as well as instruments in stainless steel and with chromium plated finish, bags of all classes and descriptions, etc.—in fact, anything required by the veterinarian—are always available either from stock or at very short notice. Price lists are available on application.

Diseases of Animals Acts.

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th Dec. 1934	16	18	14	2,195	2	2	49	96	62
Corresponding period in									
1933	10	10	—	—	3	3	90	70	33
1932	18	21	1	79	4	6	48	45	12
1931	18	18	—	—	5	5	35	103	58
Total 1st January to 15th December, 1934	371	419	75	9,848	111	183	632	1,727	978
Corresponding period in									
1933	278	324	87	7,805	128	216	525	1,366	890
1932	327	396	18	1,422	121	186	307	1,512	733
1931	442	491	97	10,649	133	231	302	1,912	832

NOTE.—The figures for the current year are approximate only.

§ Excluding outbreaks in Army Horses.